NETWORK WORLD

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Insurers team up for net project

By Barton Crockett
Senior Writer

DALLAS — A task force representing the nation's largest life insurance brokers last week took the first step toward developing an industrywide network linking brokers with insurance suppliers.

The task force is a subcommittee of the National Association of Independent Life Brokerage Agencies (NAILBA), a trade group representing more than 200 independent brokers. The subcommittee's goal is to establish a network that would let independent brokers communicate with multiple insurance suppliers to prepare and process policies.

One source close to the project compared the proposed network to an airline reservation net that lets travel agents book flights with several airlines from a single terminal.

Such a network would slash policy-processing costs and improve business ties between independent life insurance brokers and suppliers. Insurance brokers act as middlemen, obtaining policies for their clients from a number of insurance providers.

This could be a boon to independent brokers, who currently must process policies manually or work with the proprietary

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SHELLY KATZ/BLACK STAR

Northern Telecom VP Timothy Sullivan talks strategy at a special briefing on the company's new Meridian Data Networking System.

VSAT net gives McKesson competitive edge, savings

Satellite net replaces leased lines, improves reliability and helps insulate against disaster.

By Paul Desmond
Staff Writer

RANCHO CORDOBA, Calif. — Three days before fire destroyed Illinois Bell Telephone Co.'s Hinsdale, Ill., central office last May, McKesson Corp. installed the satellite hub for its VSAT network here — a move that will enable the company to pick up $9 million per year in new business from competitors whose nets were crippled by the disaster.

With the hub in place at its data center, the wholesale distributor only had to cut over the very small aperture terminal already installed at its Romeoville, Ill., distribution center near Hinsdale to maintain communications to the area. The distribution center was able to service its customers and clients whose usual suppliers were knocked out of commission.

At the time of the Hinsdale fire, McKesson had only just begun implementation of its VSAT net. Now, the company has intalled VSATs at all 65 of its distribution facilities to tie them to its

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NTI advanced data network set to bow

Northern Telecom discloses details of Meridian DNS integrated voice/data networking system.

By John Cox
Senior Editor

RICHARDSON, Texas — Northern Telecom, Inc. is scheduled to announce tomorrow an intelligent network system designed to merge disparate computers and local- and wide-area networks into a single, centrally managed network that integrates both voice and data traffic.

The Meridian Data Networking System (DNS), detailed by company officials in a briefing with *Network World* last month, is the culmination of a two-year, $100 million development effort. The system is based on the former DV-1, a discontinued Northern Telecom office automation system.

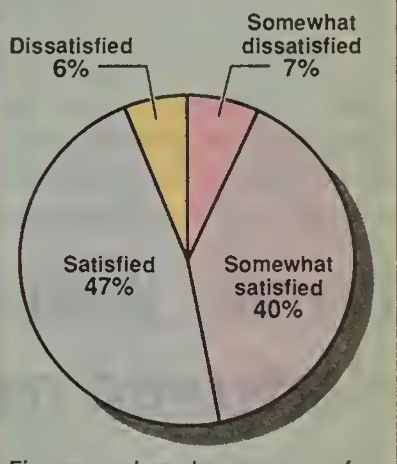
Timothy Sullivan, vice-president and general manager of Northern Telecom's Data Communication Systems division — formed here to develop the DNS — said the system will enable users to build utility networks capable of tying end-user devices to a wide range of resources.

The DNS will be formally introduced at a press conference in New York.

The DNS is a strategic new direction for Northern Telecom, which has made its name as a manufacturer of central office switch equipment and private branch exchanges. "NTI is not known as a heavyweight in the data communications business," acknowledged Sullivan, who worked at IBM for 21 years in data communications and network management. The DNS

(continued on page 4)

User satisfaction with Centrex provider



Figures are based on a survey of 117 users.

SOURCE: NATIONAL CENTREX USERS GROUP, CHICAGO
GRAPHIC BY SUSAN J. CHAMPENY

Users speak on Centrex satisfaction

By Bob Wallace
Senior Editor

HOUSTON — While Centrex users are generally pleased with their service providers, they are less enthusiastic about the service itself and such items as support and training, according to a detailed survey obtained last week by *Network World*.

The survey was conducted by the National Centrex Users Group (NCUG), which will release the results to members at the group's annual meeting here this week. The group surveyed 615 members and received 117 responses from across the country.

NCUG President Richard Jenifer, a telecommunications specialist with CNA Insurance Co. of

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NETLINE

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IBM E-MAIL USERS can link with DEC and Wang E-mail systems using the Office Interconnect Facility, Big Blue's latest multivendor offering. Page 2.

PRIME AND DIALCOM will pitch electronic messaging systems using Prime minis and Dialcom software. Page 2.

MCI AND AT&T SHOW strong financials for the third quarter, but AT&T warns it may take a $5 billion write-off that could hurt earnings in future quarters. Page 5.

AT&T DETAILS ITS systems integration strategy and the role of its fledgling Systems Integration Division. Page 6.

THE LOCAL NETWORK landscape is changing, and communications managers face many new concerns. *Network World* looks at the issues. Page 39.

NEWSPAPER

FEATURE

Departments debate LAN management dominion

For users, managers and MIS, local network responsibility depends on your point of view.

By James Kobielus
Special to Network World

Perspectives on local network management differ depending on where you stand in the corporate structure. MIS, communications and end-user departments each claim some special, though not exclusive, competency to manage these peer-to-peer, distributed data systems.

Many companies are trying to apportion local network management responsibilities among the three interested parties. King Solomon never had it this tough.

Divvying up local net management duties is no easy feat, largely because each of these groups can claim to some extent that the local-area network is its baby. It's as if everybody's trying to diaper the same baby at

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MANAGEMENT UPDATE

IBM E-mail software links with DEC, Wang systems

Big Blue package lets DISOSS, PROFS users work with VMSmail, All-In-1, Wang OIS and VS.

By Paul Desmond
Staff Writer

RYE BROOK, N.Y. — In its second announcement of multivendor connectivity in as many months, IBM last week unveiled software that lets users of its electronic mail systems exchange messages with users of Digital Equipment Corp. and Wang Laboratories, Inc. products.

IBM's Office Interconnect Facility software lets IBM Professional Office System (PROFS) and DISOSS users exchange messages with DEC VMSmail or All-In-1 users, as well as with Wang Office Information Systems (OIS) word processor or VS computer users, regardless of whether they are running Wang Office software.

The unveiling of Office Interconnect Facility follows Big Blue's announcement last month of its Open Systems Message Exchange, software that allows IBM systems to exchange messages with other processors supporting the Open Systems Interconnection X.400 protocol ("Networks shine in IBM product rollout," *NW*, Sept. 26).

Analysts said the new software handles functions previously supported by other vendors. While not particularly impressed with the software's functionality, they said it was significant because it shows a commitment by IBM to multivendor environments.

IBM's Office Interconnect Facility, developed in conjunction with Aratek International, Inc. of Toronto, is a group of software products that, when used together, support connectivity among IBM, DEC and Wang products.

The software consists of two base products: Office Interconnect Facility/VM, which resides on a mainframe running VM and supports PROFS; and Office Interconnect Facility/MVS, which resides on an MVS host and supports DISOSS.

Three optional features supply the connectivity to DEC and Wang systems: DEC Feature, Wang OIS/VS Feature and Wang Office Feature. These components run on the target system and are tied in through an application program interface.

Support for the Wang environments is provided through three packages designed to give users the option of communicating with Wang systems, even without Wang Office.

Richard Abineri, director of applications systems management for IBM's Applications Sys-

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Prime, Dialcom to develop electronic message system

Will outfit Prime minis with message software.

By Bob Brown
Senior Writer

NATICK, Mass. — Prime Computer, Inc. and Dialcom, Inc., a subsidiary of British Telecommunications plc, last week unveiled plans to jointly develop and market communications systems for electronic messaging.

Dialcom is trying to package its public service products, which have been running on its own Prime computers since 1978, for the end-user market, according to Karen Chun, director of marketing services for Dialcom. Dialcom and its 20 licensed service providers around the world use more than 130 dedicated Prime systems to support X.400-based services.

The firms plan to market Prime's 50 Series superminicomputer outfitted with Dialcom's PathFinder electronic messaging software for users whose needs warrant dedicating a superminicomputer to internal and external electronic messaging.

The system will be offered as a package with Dialcom network services, although customers can use any transport options they choose, according to Chun.

The company will offer some incentives to encourage users to utilize Dialcom, but those details have yet to be worked out, she said.

Prime and Dialcom also plan to jointly develop a gateway product that will allow current Prime users to access Dialcom's data network.

The plan marks Prime's first cooperative effort in the networking services arena, said Michael Forster, president of Prime's general markets division.

The first phase of the effort, the joint marketing of PathFinder and the 50 Series machines, will provide users with a private system for local and global messaging. This package is aimed primarily at Fortune 1,000 companies.

The PathFinder software supports the X.400 electronic messaging standard and will enable customers to send messages in multivendor networks and to business and government parties

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Briefs

MCI loses business. MCI Communications Corp. told the Federal Communications Commission last week that it has lost all business with Holiday Corp. as a result of the commission's decision to let AT&T offer services under Tariff 15 while the tariff is being studied. MCI said it was notified earlier this month that 110 Holiday Inn locations, representing a total of $400,000 per month in revenue, would convert to AT&T services offered under Tariff 15. MCI and AT&T were required to file comments regarding a number of issues under investigation for Tariff 15.

In its filing, MCI reiterated its claim that the Holiday bid was not exclusive and that AT&T's offer under Tariff 15 is customer-specific. By allowing AT&T to cut prices on a customer-by-customer basis, the FCC has effectively deregulated AT&T, the carrier charged. MCI also contended that AT&T's introduction of Tariff 15 pricing plans for other customers will hamper competition. MCI claimed it has learned that AT&T will require potential Tariff 15 customers to provide them with competitive proposals from other carriers as a precondition to establishing eligibility for Tariff 15 plans.

AT&T claims that MCI's offer to Holiday is customer-specific, and since the FCC has found such deals to be permissible for nondominant carriers, they should also be permissible for AT&T.

Rockwell wins ACD deal. Rockwell International Corp.'s Switching Systems Division won a $25.7 million contract to provide the Social Security Administration with 37 Galaxy automatic call distributors (ACD). Rockwell will install the systems in Social Security sites in the U.S. and Puerto Rico within 18 months. ACDs at seven of the 37 sites will be equipped with voice-response units that will handle the large amount of calls the administration expects when it cuts over a nationwide toll-free 800 information number.

Group buys 80% of Globenet. A consortium of five investors, including packet switch maker Telematics International, Inc. and four venture capitalists, recently purchased 80% of Globenet, Inc., a packet network carrier. Globenet said it will use the cash infusion to finance its bid to become the third major U.S. value-added network provider. The company intends to market its network as the interexchange backbone for the packet networks of the seven regional Bell holding companies.

E-mail alliance announced. Bell Atlantic Corp. and Telenet Communications Corp. last week announced a strategic alliance that will enable Bell Atlantic to offer electronic mail service, pending approval of the Federal Communications Commission. Both parties claimed the agreement is the first between a regional Bell holding company and an enhanced service provider for E-mail. Under the arrangement, The Chesapeake and Potomac Telephone Co. of Maryland and Bell Telephone Co. of Pennsylvania will offer services built on Telenet's Telemail electronic messaging service. Customers with personal computers equipped with modems will be able to transmit messages, documents, business spreadsheets and graphics via E-mail, Telenet said.

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Data Communications
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Management Strategies
Although cellular telephones have only been on the market for about five years, they already play a critical communications role for some users. **Page 29.**

Products & Services
After years of selling its interconnection software to other vendors, Retix last week announced it will market a local network-based X.400 electronic mail system to end users. **Page 33.**

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The FLEXIBLE Choice

NTI advanced data net set to bow

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will be marketed to large users and systems integrators, including the regional Bell holding companies. The company has orders for 11 pilot systems from companies in five industries.

One beta-test site, an insurance company, is scheduled to bring up a 100-site DNS network by the end of the year, according to Sullivan.

Each DNS node supports interfaces for a range of peripherals, host systems, local networks, PBXs and wide-area network systems and services. Nodes also house processor and storage modules to support network applications, such as X.400 mail services, and some server functions, including file storage for MS-DOS- and Unix-based systems.

Besides making it possible to consolidate multiple networks, the DNS supports centralized network management and a common user interface. All workstation users see essentially the same DNS option menu, according to James Bartoszewicz, Northern Telecom's director of product line management for DNS.

Terminals normally tethered directly to hosts, as in IBM Systems Network Architecture environments, are "owned" by local DNS nodes.

Besides opening connectivity options, this separation from the host enables network managers to reconfigure the network without shutting it down, often a requirement with IBM SNA networks.

One DNS node can be used to manage an entire network of remote nodes. All configuration changes can be entered centrally and downloaded to other nodes. These nodes, in turn, funnel all alarm data back to the central node, where it is displayed on a high-resolution color monitor that employs windowing and a mouse to simplify information display and net manipulation.

DNS nodes have two shared 20M bit/sec buses: one circuit-switched and the other packet-switched. Nodes are configured using a mix of network interfaces and specialized processor modules, which are based on Motorola Corp. 68000-class microprocessors.

This architecture is designed to provide users with four key functions: network access control, nodal application services, wide-area network transport and centralized net management.

Access

Local devices are attached to DNS nodes through three types of shared resource units, which are installed within the node. These are T-1 Processors, Access Processors and LANLink processors.

The T-1 Processor, which is scheduled to be available early next year, will support up to 16 T-1 links to local on-premises PBXs and T-1 multiplexers.

Access Processors, also scheduled to be available early next year, will be used to support different types of local networks. The DNS will support Ethernet, IEEE 802.3 Ethernet, IEEE 802.3 10BaseT twisted-pair Ethernet and IEEE 802.5 token-ring networks, according to Bartoszewicz.

The DNS will also be able to act as an Internet Protocol gateway for Ethernet-type networks that support Transmission Control Protocol.

The third type of internal module, LANLink (a misnomer since it is not used with local networks), can support up to 24 stand-alone interface devices over twisted-pair wire at distances up to 2,000 feet. These interfaces are used to support terminals, host systems, controllers, modems and printers.

LANLink supports three types of interface units:

- Channel Interface Units provide a channel attachment to IBM System/370-type mainframes, to which the DNS looks like a locally attached IBM 3274 terminal controller. The DNS supports what Bartoszewicz described as logical unit pooling, a technique that lets DNS sidestep the classic SNA master-slave relationship. As a result, network managers can reconfigure the network independently of the host.

Non-IBM hosts are supported through X.25 or Ethernet interfaces.

- LAN Interface Units support cluster controllers, front-end processors, modems and printers through two RS-232 ports and one Centronics parallel printer port. An optional port extender provides eight additional RS-232 or two V.35 interfaces.
- The third interface unit supported by LANLink is PCLink, an interface card for IBM Personal Computer AT and compatible microcomputers and the IBM Personal System/2.

Northern Telecom employs the DNS node's intelligence and up to 3G bytes of memory to supply a battery of network services and applications.

"Network services are shifting from the host to the network," Bartoszewicz said.

Services include routing directories, X.400 mail and the ability to share print and file services locally and at remote DNS nodes.

Terminal-emulation services enable attached microcomputers to emulate both IBM 3274 and Digital Equipment Corp. VT-100 terminals. Remote ASCII terminals also can access nodal services and applications. DNS eventually will support protocol conversion as well, Bartoszewicz added.

The DNS also supports Unix and MS-DOS, enabling it to function as a file repository for MS-DOS and Unix applications, according to Bartoszewicz.

DNS nodes can be tied together in wide-area networks with a range of transport options, including 1.54M bit/sec T-1 links, digital data services at speeds up to 56K bit/sec, public and private X.25 packet networks, and leased lines.

Nodes can function as both packet assembler/disassemblers and packet switches supporting up to 512 virtual circuits, Bartoszewicz said.

Eventually, the company will offer a T-1 multiplexer option as a separate cabinet, what the company called a bandwidth manager, that will provide the usual mix of T-1 multiplexer features such as drop and insert.

The company said it also plans to support the Integrated Services Digital Network Primary Rate Interface.

Network management

As a network management controller, a DNS node maintains a profile of each user, including user identification, logon name and password. Each user is classified as belonging to one of three access classes, which define the applications and services available.

Informix Software, Inc.'s Informix relational data base management system is used to manage data on network and node configuration, traffic and trouble tickets. The data can be presented in 11 standard reports or in custom reports.

In addition, the DNS can pick up data from a variety of network subsystems and relay it to the central network manager. According to Bartoszewicz, Northern Telecom plans to work with third-party network equipment vendors, such as modem manufacturers, to integrate their management systems into the DNS.

The network will also embrace both IBM's NetView management software and, as they are defined, Open Systems Interconnection net management protocols.

This combination could prove a potent one, according to George Colony, president of Forrester Research, Inc., a Cambridge, Mass., consultancy. Users will be able to use a standard platform to build potentially very large private voice/data nets, he noted.

That in itself is "no great shakes," he said. "The big deal about this is the nodes used to build a wide-area network can also build into the local net."

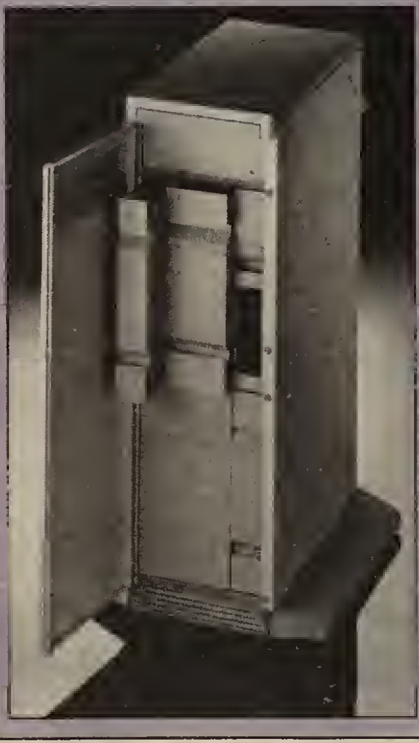
In Colony's view, corporate users are struggling to blend local- and wide-area networks. DNS seems to offer a "common ground" for this.

In addition, the standard character of the network platform may provide a real incentive to third-party companies to load up a DNS node with a variety of specialized applications and interfaces, he noted. And the architecture lets users change network configurations easily.

But one potential drawback is that many corporate users now are building networks to solve very specific problems, Colony pointed out. The "do-anything Swiss army knife" DNS may not impress a network user who wants an 11-in. Bowie knife, he said.

The DNS costs $50,000 to $90,000 per node, depending on configuration. It is available now. ◘

Meridian Data Networking System (DNS) profile



Device support:

Host: Channel attachment to IBM mainframes and links to IBM front-end processors; Ethernet and X.25 connections to other hosts

Workstations: IBM Personal Computer ATs, Personal System/2s, ASCII terminals, Apple Computer, Inc. Macintoshes, IBM 3274 cluster controllers

Local nets: Ethernet, twisted-pair Ethernet, Transmission Control Protocol/Internet Protocol, token ring

PBXs: Through T-1 interface

T-1 multiplexers: Through T-1 interface

Meridian DNS applications:
Print and file server, X.400 electronic mail, directory services, terminal emulation, host file transfer

Wide-area network interfaces:
X.25 packet networks, T-1, ISDN Primary Rate Interface, digital data services, leased lines

Network management:
Centralized control for configuring Meridian DNS networks and managing alarms; color graphical user interface with pull-down menus and windowing; data base for configuration, traffic and trouble tickets; report generation.

SOURCE: NORTHERN TELECOM, INC., RICHARDSON, TEXAS
GRAPHIC BY SUSAN J. CHAMPENY

Prime, Dialcom develop system

continued from page 2

that use the X.400 international messaging standard.

"Somebody could have computers from Vendor A, B and C either collocated or geographically dispersed, and the PathFinder system running on a Prime Series 50 computer can act as a switch between those systems for their X.400 mail," said Michael D'Eath, senior manager of network services applications at Prime.

The PathFinder software can be used to maintain a central directory and handle billing for Dialcom services.

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The PathFinder software can be used to maintain a central directory and handle billing for Dialcom services, D'Eath said.

The second phase of the plan will cover the joint development of a gateway product that will complement a number of X.400 electronic mail products already under development by Prime.

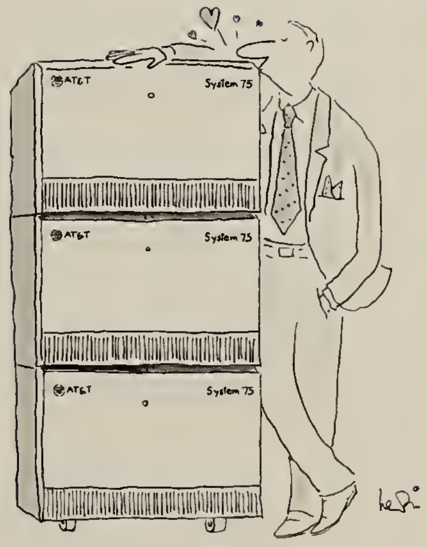
The gateway, which is only in the discussion stage according to both companies, is aimed at Prime customers that want access to services from Dialcom, D'Eath said.

Currently, Prime users can gain access to Dialcom services by using packet assembler/disassembler equipment or an X.25 connection, but the gateway is intended to be "a more elegant approach," he explained.

Dialcom plans to market future Prime products, especially those providing document-conversion capabilities, to its business and government customers.

The two companies also plan to swap information in areas such as electronic data interchange and the development of directories for message systems based on the emerging X.500 international standard. ◘

Correction: The article "Mac nets help firm make investments" (*NW*, Oct. 3) incorrectly attributed quotations from a spokesman for Aria International to Ian Hobson, information systems manager with Hambrecht & Quist, Inc., an Aria customer. Hambrecht & Quist is an investment banking and venture capital firm and does not deal in commodities, as one quote implies. We regret any confusion or inconvenience this may have caused.



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Users speak on Centrex

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Chicago, said survey respondents operate Centrex systems ranging in size from 40 to 10,000 lines.

"The National Centrex Users Group 1988 Customer Satisfaction Survey" asked group members to rate the telephone company that provides their Centrex service. (The survey did not discuss specific providers.)

The majority of respondents said they were satisfied with their Centrex service providers (see chart, page 1). A total of 13% said they were dissatisfied or somewhat dissatisfied with their providers.

Jenifer said the "somewhat dissatisfied" rating denotes subpar performance by the carrier.

Most respondents (65%) said they found their Centrex service provider easy to deal with, while the remaining portion disagreed.

Most users also said overall performance of their Centrex was excellent or good, although more than a quarter of them rated their Centrex as fair, poor or bad.

> Jenifer said the "somewhat dissatisfied" rating denotes subpar performance.

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In the area of customer service, 17% of the respondents said service was excellent, and 43% said it was good. But some 40% said service provided by the Bell operating companies fell between fair and bad.

BOC-provided sales and marketing services could also be better, according to the survey results. About 10% of all respondents said these services were excellent. Forty-five percent of the respondents said they were good, and 45% said they were either fair, poor or bad.

Thirty-four percent of the respondents rated telephone company-provided Centrex training services fair, poor or bad. Thirteen percent rated the services excellent, while 53% said they were good.

"I've heard about these problems for a long time," Jenifer said. "The results are simply a reaffirmation of what I have been trying to explain to the BOCs for about two years now."

One respondent, John LeSueur, telecommunications manager for Sherwin Williams Co., a Cleveland-based paint firm, said the BOCs need to improve their support services as soon as possible.

"We need [support] people that understand the capabilities of Centrex service," he said.

About half the respondents said they were pleased with the Centrex monitoring and administration capabilities provided by the BOCs.

Centrex users said they would use on-premises terminals to monitor system performance and perform station moves, adds and changes. BOCs have offered their largest Centrex users these features to keep them from replacing the service with private branch exchanges, but smaller users generally do not receive the capabilities.

In terms of problem resolution, 23% of the survey respondents said they were satisfied with action taken by the BOCs to resolve service problems. Thirty-six percent said they were somewhat satisfied, and 31% said they were neither satisfied nor dissatisfied. Ten percent said they were somewhat dissatisfied or dissatisfied with the way the BOCs resolve Centrex problems.

Although the survey did not contain a specific question on the topic, a number of respondents commented that they were unhappy with the speed with which new Centrex features were offered.

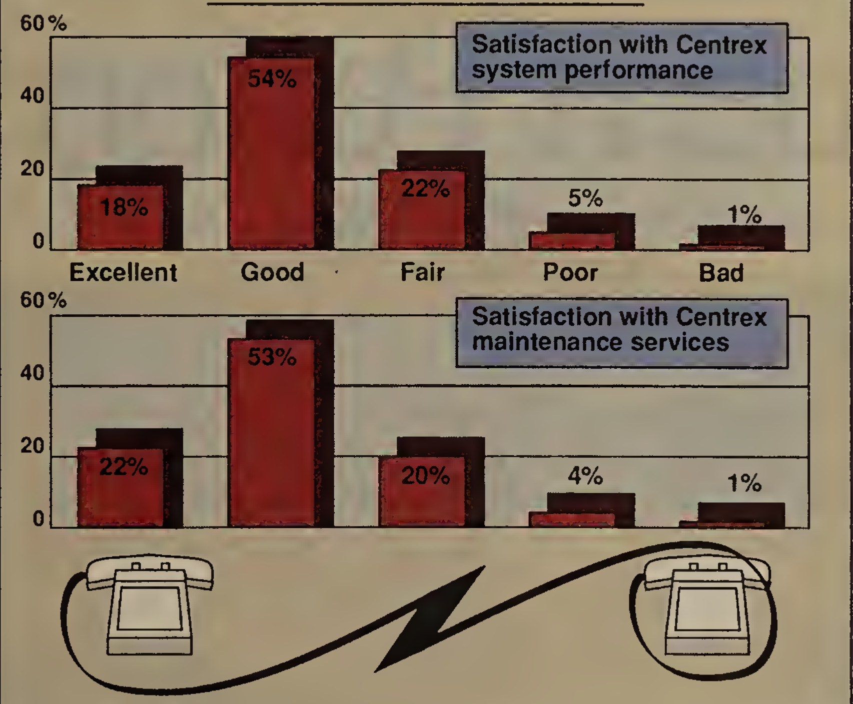
Among the several pages of comments were repeated requests for new and advanced Centrex features. Such features included improved billing, electronically transmitted call detail information and data handling capabilities.

The survey asked Centrex users which factors they considered during the service selection process. Forty-three percent said cost, 40% indicated service, and 17% listed other items such as the flexibility and reliability of the service.

Centrex users were then asked what factors figured prominently in their decision to use the central office-based service instead of premises-based PBXs.

Thirty-one percent of the respondents said cost was a major factor, 30% said reliability, 28% said service, and 11% listed other factors, such as design, flexibility and the amount of space needed for a PBX.

The majority of survey respondents, 52%, said their telephone company installed the on-site Centrex equipment, 16% installed it themselves, and 32% had third parties perform this task.



User views on Centrex

Figures are based on a survey of 117 users.

SOURCE: NATIONAL CENTREX USERS GROUP, CHICAGO
GRAPHIC BY SUSAN J. CHAMPENY

Interlan software links NetWare and LAN Manager

By Rex Bowman
West Coast Correspondent

BOXBOROUGH, Mass. — Interlan, Inc. last week announced software that allows users on Novell, Inc. NetWare-based local nets to access servers running Microsoft Corp.'s OS/2 LAN Manager using NetWare commands.

Called LMN Server, the software resides on a LAN Manager-based file server and allows workstation users on a NetWare network to work with applications on the OS/2 LAN Manager server. It also allows NetWare users to share files and electronic mail with workstations on OS/2 LAN Manager-based networks.

The Novell and OS/2 LAN Manager networks can be physically linked through such things as bridges and repeaters, or the NetWare server and OS/2 LAN Manager server can reside on the same network.

Because LMN Server supports Microsoft's Network Driver Interface Specification, it will operate with all OEM versions of OS/2 LAN Manager, including 3Com Corp.'s 3+Open LAN Manager, said George Jones, product manager for Interlan.

"LMN Server allows users to take advantage of the OS/2 LAN Manager device as if it were a NetWare server," Jones said. "It provides transparent interoperability.

"Both Novell and Microsoft

(continued on page 58)

AT&T, MCI report strong 3Q financial performances

But AT&T warns it may take $5 billion write-off.

By Bob Brown
Senior Writer

MCI Communications Corp. and AT&T both posted strong third-quarter results last week, although AT&T hinted that it may have to write off as much as $5 billion in network assets in future quarters.

MCI reported that earnings rose to $99 million in the third quarter, which ended Sept. 30, up from $17 million in the third quarter of last year. Third-quarter revenue jumped about 36%, to $1.36 billion from $994 million in the third quarter a year ago.

AT&T's earnings for the same period grew by about 16%, to $587 million from $505 million in the third quarter last year. AT&T's revenue for the third quarter increased to $8.74 billion, up about 3% from $8.47 billion in the corresponding period last year.

But in its financial statement, AT&T said it may have to write off or speed depreciation of $4 billion to $5 billion in analog network equipment and facilities, a move that could hurt future earnings. The equipment and facilities would become obsolete because of what AT&T described as its stepped-up efforts to make its network completely digital.

MCI surges

MCI attributed much of its revenue growth during the quarter to its 800 and international services.

The second-largest long-distance carrier also announced its entrance into the 900 service market during the past quarter.

During the quarter, MCI won several multimillion- dollar contracts, including deals with Ford Motor Credit Co. and J.C. Penney Co., Inc.

Bert Roberts, MCI's president and chief operating officer, said MCI exceeded expectations in "virtually every market segment" during the quarter — despite the fact, he said, that the summer months are traditionally slower.

"MCI's entry into new markets, its product improvements and its success in serving large business accounts have prompted users to adopt a multivendor approach to telecommunications," Roberts said.

"Those results indicate that MCI continues to make progress in picking up market share," said Joseph Battipaglia, a research analyst at the regional brokerage firm of Gruntal & Co. in New York. "They are squeezing some of their competitors while taking some points away from AT&T."

AT&T Chairman Robert Allen pointed to 11% growth in sales of computers and communications equipment, increased long-distance revenue and continued investment in marketing and customer service as keys to the company's improved results.

He said redeployment of some 1,300 employees to field sales positions during the quarter helped win back tens of millions of dollars in contracts from customers that had been using other carriers' services. The company plans to shift another 1,700 employees to sales jobs in coming months, the company said.

WATS blamed

AT&T said it suffered a decline in revenue from its domestic outbound business services, especially WATS, as a result of competition in this market.

The company also said other long-distance carriers, such as US Sprint Communications Co., have shifted traffic from AT&T facilities to their own networks.

Analysts estimated that AT&T's business services revenue was almost flat for the quarter.

Speaking about the stepped-up digitization of its network, Allen said AT&T expects 95% of its facilities to be digital by the middle of next year — compared with 85% today — and 100% to be digital by the end of 1990.

> "Tariff 15 will help, but what AT&T needs are price caps," Sawers said.

▲▲▲

Analysts said the results make it plain that AT&T is in for a long-term battle for the hearts and dollars of business customers.

Greg Sawers, a telecommunications analyst at Sanford C. Bernstein & Co., Inc., a New York-based brokerage firm, said AT&T needs to do several things to become more competitive.

The company has to cut costs and fight harder for more flexible pricing, he said.

"Tariff 15 will help, but what AT&T needs are price caps," Sawers said. "Until the abnormal pricing environment in long distance is resolved, I'll keep betting on MCI."

AT&T said it "gained significant ground during the quarter in its drive for greater pricing flexibility," citing the Federal Communications Commission's tentative approval of Tariff 15, which lets AT&T counter competitors' discounts on long-distance service to large accounts.

AT&T reveals its systems integration plan

By Jim Brown
New Products Editor

NEW YORK — At a press briefing here last week, AT&T provided insights into its systems integration strategy, detailing the services its recently formed Systems Integration Division will provide to large users.

AT&T officials said the division will help users develop data networks, network management systems and telemarketing applications by providing consulting, network design and engineering, software development, installation and network management services, as well as maintenance and facilities management services. The division will sell both AT&T and non-AT&T equipment and will help users integrate systems from a variety of vendors.

For instance, the division will help users develop telemarketing applications in which AT&T calling services, automatic call distributors and private branch exchanges work with data stored on AT&T and non-AT&T processors. It will also help customers build data networks that support integrated voice mail, electronic mail, electronic data interchange and image transfer applications.

In addition, the division will aid users in creating custom integrated network management systems based on AT&T's Unified Network Management Architecture.

"AT&T's Systems Integration Division will use whatever resources are necessary, including products and capabilities from other companies," said Chuck Yates, vice-president of the Systems Integration Division. "There is more of a willingness to work with other vendors' equipment."

The division was formed last March as a competitive response to the growing number of vendors targeting the systems integration market. For instance, IBM recently formed a systems integration division, and other companies have struck agreements to jointly build custom networks.

Northern Telecom, Inc. and Hewlett-Packard Co., for example, formed a joint marketing and product development company last May that will build custom voice and data networks.

Analysts said AT&T's systems integration strategy is a logical one. "They feel they have skills from building and running their own net that they can leverage into a profit center," said Peter Bernstein, senior analyst at the Cedar Knowles, N.J., office of Probe Research, Inc., a market research firm.

"Everybody today wants to be a systems integrator," he said. "AT&T has a tremendous history in networking, and the critical portion of systems integration is hooking everything up."

The Systems Integration Division will be headquartered in Basking Ridge, N.J., with some staff located in AT&T regional offices across the country. The division will operate as part of AT&T's Business Markets Group, which sells AT&T PBXs and other telephone equipment.

It will initially market its services to midsize-to-large financial services firms, manufacturers and retail distributors. Yates said the division will target other customers in the near future.

The division has a technical staff of about 200 employees drawn from AT&T's MIS department, AT&T Bell Laboratories and its Network Operations Group, and it will rely on AT&T's existing sales force. After being called to the customer site by AT&T sales personnel, the systems integration staff will develop a proposal outlining the products and services needed to help meet customer requirements.

The division will be able to acquire additional staff members from other AT&T groups to meet individual project demands. In addition, the division can ask other AT&T groups to develop custom products.

Yates said AT&T will strike alliances with third-party vendors that can provide products AT&T cannot. He also said AT&T would consider purchasing companies capable of providing AT&T with capabilities it currently lacks. Yates declined to identi-

(continued on page 59)

Kodak plans move from private voice mail net to service bureau

By Bob Wallace
Senior Editor

ROCHESTER, N.Y. — Eastman Kodak Co. said last week it will hand over its 28,000-user voice mail network to Tigon Corp., a service bureau based in Dallas.

Kodak, one of the nation's largest voice mail users and a pioneer in the application of the technology, sold its 11 VMX, Inc. voice mail systems to Tigon for an unspecified amount.

Under the multiyear agreement, Kodak's voice mail traffic — roughly 600 hours of messages a month — will be migrated to Tigon's Trax network during the first quarter of 1989. The Trax network consists of VMX systems located throughout the U.S., Japan and the UK that are interconnected with roughly 800 lines.

"Tigon is the only service bureau that can manage large voice mail networks like ours," said Roger Benson, a telecommunications services technical specialist for Kodak. An on-site Tigon team will oversee operation of Kodak's voice mail network from Kodak's corporate headquarters here, he said.

"This is a major coup for Tigon," said Karl Kozarsky, vice-president of voice services for Probe Research, Inc., a Morris-

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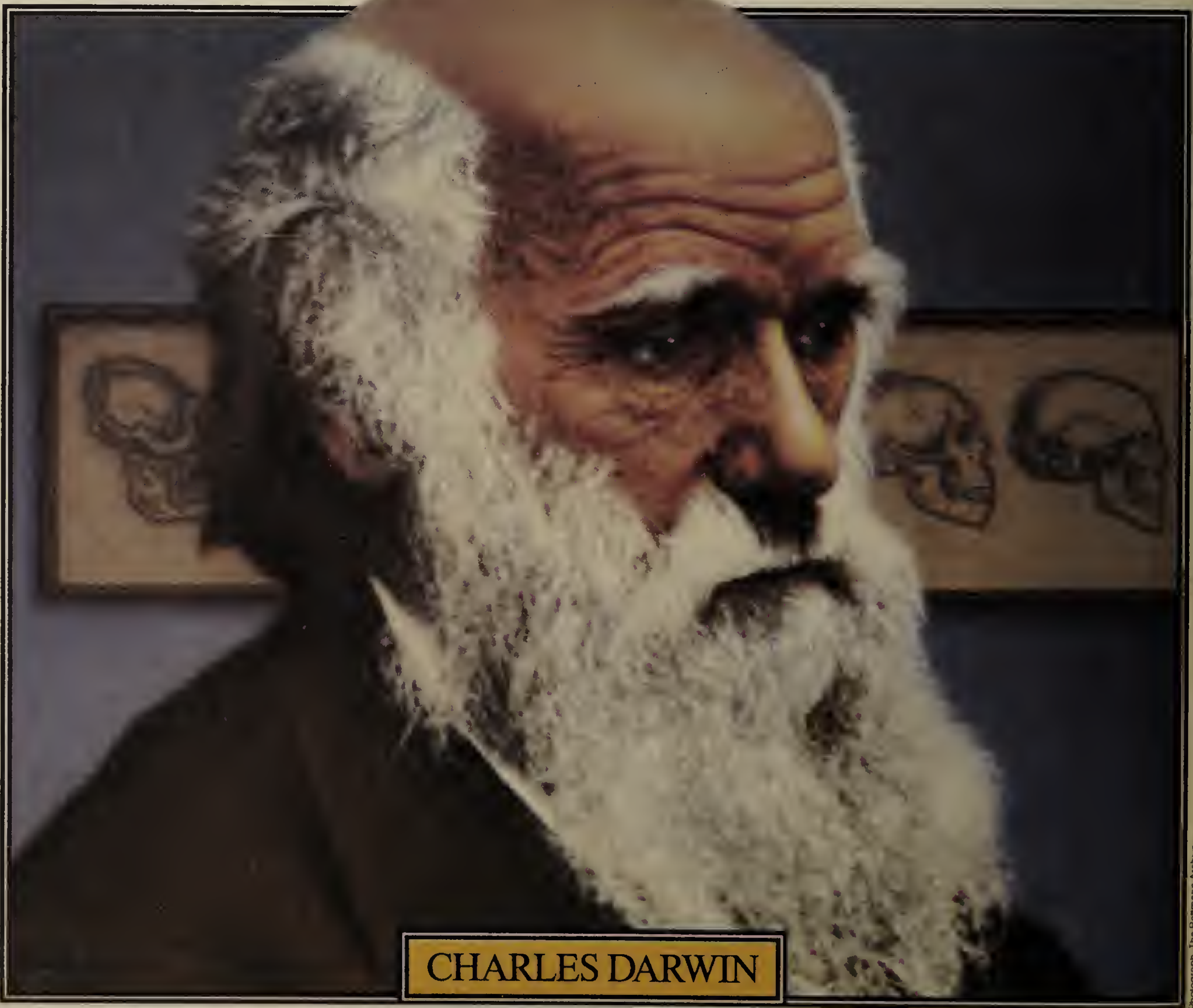

Photograph: The Bettmann Archive

Charles Robert Darwin, English naturalist, 1809-1882. His comprehensive treatise, *On the Origin of Species* (1859)—and his later work, *The Descent of Man*—fundamentally changed the field of natural history. The broad ideas of the Darwinian principle of Natural Selection became the basic elements of virtually all evolutionary theory for the next 100 years.

town, N.J.-based communications consulting and research firm.

"The [Kodak] deal alone gives them half as many subscribers as the next largest voice mail service bureau," Kozarsky estimated. The Kodak contract will help boost the credibility of voice mail service providers."

Earlier this year, another major user, Ford Motor Co., replaced its voice mail systems with voice mail service provided by Tigon.

This new venture is not the first time that Kodak has worked with Tigon. In 1983, the company began buying voice mail service from Tigon. After the network reached 1,000 mailboxes, the company left the Tigon net, purchased voice mail equipment and built its own network.

In 1986, Kodak signed up for Tigon's Facility Services offering, under which Tigon maintained Kodak's voice mail systems.

Last year, Kodak signed on for Tigon's Administrative System Program. Under that arrangement, the service bureau managed the network and its multiple data bases and administered all moves, adds and changes.

"Tigon has been servicing our equipment for a few years now, and they have done a very good job," Benson said.

Another large user, General Electric Co., operates its own service bureau for GE sites that cannot cost-justify buying standalone voice mail systems. The company said it may eventually consider replacing its internal service bureau with service provided by companies such as Tigon.

"I've heard a lot of other companies talk about finding someone to run their voice mail networks," Benson said. ☎

Ameritech, Motorola, NTI join to develop new ISDN applications

By Bob Brown
Senior Writer

CHICAGO — Ameritech, Motorola, Inc. and Northern Telecom, Inc. recently signed a four-year agreement to jointly develop ISDN applications for products and services to be offered by the three companies.

The agreement is intended to help the vendors identify which Integrated Services Digital Network applications users need so they can provide appropriate tools. The products and services will actually be put to the test at Motorola, where they will be used to support everyday operations.

In addition, user satisfaction with these services will be evaluated at a new ISDN laboratory that Motorola is setting up at its Schaumburg, Ill., headquarters. Representatives from all three companies will have access to the laboratory to develop new applications, products and services.

The agreement teams three vendors at the forefront of the ISDN market. Ameritech, through Illinois Bell Telephone Co., last year began offering the country's first commerical ISDN services — Ameritech Integrated Digital Network. Northern Telecom makes digital switches that are ISDN-compatible, and Motorola makes semiconductors that are used in ISDN equipment.

"Our industry has focused for the last several years on trials to make sure ISDN works," said David Orr, vice-president of marketing planning at Ameritech Services, Inc., the Schaumburg-based planning and procurement arm of Ameritech's five telephone operating companies. "By forming this alliance, we're going one step further. We're looking for new applications we can show our customers so they can use the voice, data and video capabilities of ISDN to their advantage."

The first applications to be studied will include use of ISDN in telemarketing and to improve office productivity via file sharing or linking personal computers, said Martin Johanson, senior director of business products at Ameritech Services.

While Motorola considers itself "a voluntary guinea pig" in this collaboration, all three companies will be guinea pigs of sorts, said David Morgan, corporate director of computer and communications research and development at Motorola. The three firms plan to manage this project using ISDN networks to communicate with one another, he said.

Motorola, a maker of semiconductors and communications hardware, will use the current and future ISDN products and services to improve productivity and customer service. Motorola said it plans to do this by improving communications among its corporate departments.

By using ISDN to link operations such as sales, marketing, engineering and distribution, Motorola will be able to save time on a number of tasks, from product development to customer service, Morgan said. For example, a Motorola design engineer at one site could discuss changes needed on a product design with a manufacturing engineer at another site as the two engineers viewed the same images on their workstations and spoke on the telephone, he said.

Eventually, Motorola hopes to be able to use such products and services on a global basis, Morgan said.

Ameritech plans to offer the new services developed through the collaboration to other ISDN customers, he said. The company is currently conducting studies of other industries to determine how they could benefit from ISDN applications, Johanson said.

Northern Telecom, the third partner in the agreement, recently installed an ISDN-compatible DMS-100 switch in Illinois Bell's Schaumburg central office that will be used to provide Motorola with ISDN services.

The collaboration is expected to foster the introduction of new ISDN applications in less than a year, the participants said. ☎

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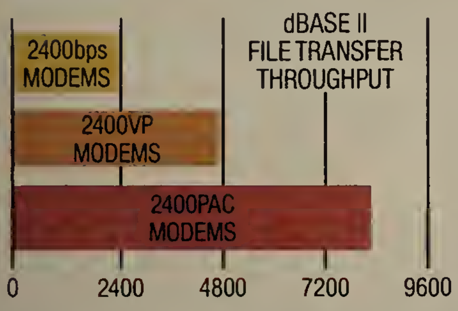

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VSAT net gives competitive edge

continued from page 1

data center. When the $5 million Contel Corp.-supplied net is completed later this year, 20 sales offices will also be tied in via VSATs.

McKesson expects the VSAT net to save it more than $1.2 million annually by eliminating leased-line costs and keeping productivity high through reduced downtime.

Also, the network gives McKesson a competitive edge by allowing the company to provide fast, more reliable service to its 20,000 customers nationwide.

McKesson uses the network to process about 25,000 orders per day for pharmaceutical, health care and other products it supplies to independent drug stores and hospitals nationwide. The company expects to process $7.3 billion worth of orders this year.

The VSAT net replaced a leased-line network, eliminating $200,000 in leased-line costs, said John Fitzgerald, vice-president of information services for San Francisco-based McKesson.

In addition, the net has reduced network downtime caused by telephone line failures, Fitzgerald said. He expects the reduced downtime to save $1 million annually in overtime wages paid to warehouse employees who had to make up for lost time due to network failures.

The Hinsdale fire provided an example of how the VSAT net prevented such downtime. After the Sunday night fire, the district manager for the area called the data center supervisor to tell him that data and voice communications to McKesson's Romeoville distribution center had been lost. Although the VSAT was installed, McKesson was still weeks away from turning it on.

Fitzgerald said the data center supervisor got Contel to make the VSAT operational within one hour after the distribution center opened for business on Monday morning. Meanwhile, McKesson's competitors were left stranded.

"As an immediate result of customers not being able to get products from their suppliers, they switched over to us during the emergency, and we've retained them," Fitzgerald said. "That increase in customer volume translated into about $9 million of additional revenue to us on an annual basis, just out of that distribution center."

Fitzgerald said Hinsdale has become a marketing tool used by salespeople to illustrate the reliability of McKesson's net.

The bulk of McKesson customers are independent pharmacies that buy drugs, health and beauty aids as well as other "nondurable" goods commonly sold in drug stores. Fitzgerald said the nondurables can include anything from pots and pans to perfume.

To order products, customers take inventory with a hand-held entry device that reads Universal Product Codes. They transmit the information here via a toll-free dial-up line to McKesson's Tandem Computers, Inc. NonStop VLX computer, configured as a front-end processor. The front end clears the order for processing by an IBM 3090 mainframe.

Customer profiles kept on the 3090 track how many of each item a particular customer usually orders, profit margins used when pricing products and other information used when shipping products.

When the processing is complete, the order is placed in the appropriate output queue for the distribution center that will ultimately fill the order. The output queues are interrogated by each distribution center via the satellite link.

IBM System/36 minicomputers at the distribution centers receive and print orders that are broadcast at 265K bit/sec over the satellite's Ku-band. Workers in the distribution centers then pick up the orders and send them out by truck for delivery to customers. Orders placed by 7 p.m. can be in customers' stores the next day, Fitzgerald said.

Inventory updates or customer profile updates can be sent to the mainframe from CRTs attached to the remote System/36. The CRTs emulate 3270 terminals and transmit data at 56K bit/sec over the VSAT link to the host.

The VSAT network provides more reliable service both for its customers and for McKesson employees, Fitzgerald said. The greater reliability of the VSATs compared with leased lines means the distribution centers will no longer lose a combined 30 days of working time each year, as they did with the leased-line network, "which means a lot to us," Fitzgerald said. "We grind to a halt if our network is not active. Our folks in the warehouses can't do anything, so they just sit around." Later, however, they have to make up for the lost time by working overtime — which, he said, costs McKesson about $1 million per year.

"In the terrestrial world, we experience outages because cables get cut, somebody pulls a jumper at a central office or cables get wet," Fitzgerald said. The only thing that will interrupt a VSAT transmission is an equipment failure or a torrential rainstorm.

However, the incoming 800 lines that customers use to transmit orders can still fail. With that in mind, McKesson has a contingency plan that calls for the toll-free calls to be routed to Oakland, Calif., where a site capable of handling preliminary processing would take the calls and transmit data here via satellite.

In addition, plans are in the works for a disaster recovery center to act as a hot backup for the data center. A McKesson subsidiary, Pharmaceutical Card Systems, processes third-party prescription claims at its Scottsdale, Ariz., data center.

Fitzgerald said that by the end of next year, that site will be made into a duplicate of the data center here. Then, in case of a disaster here, all satellite transmissions can be routed to Scottsdale.

The control features of the Contel VSAT network allow the network manager here to make a change to a backup site as well as to bring on new VSATs as necessary. The system also allows for end-to-end testing and monitoring of the network. ◼

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

The premiere demonstration of NeXT, Inc.'s NeXT Computer System to the general public will be at the Educom '88 national conference in Washington, D.C. Oct. 25 to Oct. 28. The formation of NeXT, Inc. was announced at an Educom conference in Pittsburgh three years ago, an Educom spokesman said. For more information, call (609) 520-3340.

People & Positions

Lee Foerster was recently named vice-president of network finance for **US Sprint Communications Co.**

Foerster's responsibilities include the management and reduction of access line costs, the negotiation and administration of vendor contracts, the collection and analysis of network performance data, and departmental space planning. Previously, Foerster spent 31 years at Michigan Bell Telephone Co.

Nynex International Co. recently named **Robert Heller** to the newly created post of vice-president and managing director, Europe/Asia.

He will be responsible for the international sales and marketing activities of Nynex's London, Hong Kong and Geneva offices. Heller has more than 15 years of sales and marketing experience with Nynex and Northern Telecom, Inc.

Richard Courtney has been appointed to the new position of director of network management systems and services at **Racal-Milgo.**

Previously, Courtney had been product line manager for network management systems. Racal-Milgo designs and supplies communications systems and services.

Top dollars in technology

David Packard Chairman, Hewlett-Packard Co.	$2 billion
William Gates Chairman and CEO, Microsoft Corp.	$1.1 billion
Gordon Moore Chairman, Intel Corp.	$370 million
Lawrence Ellison President and CEO, Oracle Corp.	$330 million
Kenneth Olsen President and CEO, Digital Equipment Corp.	$250 million

Amounts represent individual net worth in stockholdings.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: *FORBES MAGAZINE*, NEW YORK

Ernst & Whinney buys up Net Strategies consultancy

By Bob Brown
Senior Writer

CLEVELAND — Ernst & Whinney, one of the Big Eight accounting firms, recently acquired Network Strategies, Inc., a Fairfax, Va.-based consulting firm specializing in voice and data communications. The firms, both of which are privately held, did not disclose financial terms of the agreement.

Network Strategies will remain in its Fairfax office and will operate as a practice of Ernst & Whinney's Information Systems Group.

Ernst & Whinney's Information Systems Group offers customers consulting services in the areas of long-range information systems planning, application development, telecommunications system planning and implementation, information systems management review and security.

The addition of Network Strategies will expand the accounting firm's networking expertise, said Jeff Held, a principal with Network Strategies.

Network Strategies provides voice, data, video and integrated communications consulting services to commercial and government clients to assist them in planning, implementing and managing networks. The match makes sense for Network Strategies, which needed to offer its clients MIS expertise, Held said.

"We feel the direction of the future is toward a closer linking of information systems and telecommunications," Held said. "A firm that doesn't have expertise in both areas is going to become less viable."

Network Strategies has had to turn down potential customers in the past because it lacked expertise in data processing, Held said.

Network Strategies agreed to a buyout by Ernst & Whinney because the two companies had worked together in the past and offered each other complementary strengths, Held said.

Ernst & Whinney operates 450 offices in more than 80 countries and targets four vertical markets for its services: financial services, insurance, manufacturing and health care industries.

RBHC funneling of credit calls to AT&T ruled unfair

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — U.S. District Court Judge Harold Greene ruled last week that the regional Bell holding companies have been discriminating against interexchange carriers by routing calling card and public pay phone traffic to AT&T.

Greene said in his ruling that the RBHCs have been violating the nondiscrimination and equal access provisions of the Consent Decree and ordered the RBHCs to have plans in place by Jan. 1, 1989, that would remedy these practices.

Provisions of the AT&T Consent Decree, overseen by Greene, specify that the RBHCs must provide services to all carriers under the same terms, conditions and prices as offered to AT&T.

The first major equal access program, which is nearing completion, was directed at giving all long-distance carriers the same access to local-exchange switches.

Equal access to pay phones is becoming an important issue for interexchange carriers because many of them now offer the operator services often necessary to handle pay phone traffic. The pay phone service market is a $2.5 billion market for the RBHCs and a $1 billion business for AT&T.

(continued on page 12)

NeXT PC touts high features, low price

Steven Jobs looks to stick it to Apple with new personal computer aimed at university market.

By Bob Brown
Senior Writer

PALO ALTO, Calif. — The personal computer recently introduced by NeXT, Inc., the company formed in 1985 by Apple Computer, Inc. cofounder Steven Jobs, is packed with network power and offers a glimpse of the next-generation workstation, according to industry analysts.

While many observers said the NeXT Computer System is not earth-shattering, they praised Jobs for squeezing many leading-edge features into an economical package.

"Steve Jobs has advanced state-of-the-art again," said Michael Howard, a vice-president and senior analyst at Infonetics, Inc., a Santa Clara, Calif.-based market research and consulting company.

"He's ahead of everybody else," agreed Mike Millikin, senior analyst at Patricia Seybold's Office Computing Group, a Boston-based research and consulting company.

For school markets only

The NeXT Computer System, which produces near-photograph-quality images on its black-and-white monitor, is targeted exclusively at the education market — at least for now. Jobs recommends that business users enroll at a university if they want to use a NeXT.

The NeXT workstation is a sharp, black magnesium cube that tilts to a number of angles with the touch of a finger and combines power and ease of use. It is based on a Motorola Corp. 68030 microprocessor and runs the Mach operating system, which was developed by Carnegie-Mellon University and is based on a version of Unix System V written by AT&T and Sun Microsystems, Inc.

According to Millikin, the

(continued on page 12)

INDUSTRY BRIEFS

Teleconnect Co. and **SouthernNet, Inc.** last week announced the name of the holding company that is being created to oversee the two regional telecommunications companies. It will be called **Telecom*USA, Inc.** The name will become official once the holding company agreement is approved by regulatory authorities and Teleconnect shareholders. This is expected to take place by the end of the year.

In July, Teleconnect and SouthernNet announced their plans to unite under a single holding company. The companies plan to retain their separate names, regional operations, management teams and boards of directors.

US Sprint Communications Co. and **Bell Atlantic Corp.** last week announced the signing of a five-year contract, under which Bell Atlantic will provide certain billing and collection services to US Sprint customers in Bell Atlantic's service region. Under the agreement, US Sprint users without established accounts will receive their monthly local and long-distance telephone bills from the Bell Atlantic telephone companies. In addition, Bell Atlantic will collect payments and handle inquiries and adjustments. US Sprint has signed similar agreements with US West, Inc., Southern Bell Telephone and Telegraph Co., South Central Bell Telephone Co, Southwestern Bell Corp., Nynex Corp., Central Telephone Co. and Ameritech.

DSC Communications Corp. last week announced the signing of a five-year contract with the Immigration and Naturalization Service (INS) valued at up to $135 million for the provision of DSC communications equipment.

The DSC equipment, which will include channel banks, T-1 multiplexers and digital microwave radios, will be used to set up a network covering the entire U.S.-Mexico border.

The new equipment will be used mainly for the installation of a microwave backbone network in Southern California and West Texas. The network will expand and upgrade the INS' existing analog microwave system.

NeXT PC touts high features

continued from page 11

computer comes equipped with an Ethernet interface and supports Transmission Control Protocol/Internet Protocol so every NeXT system has the ability to be hooked into a local network. "It's expected to be used in a networked environment," Millikin said. "When it ships in the middle of next year, it'll be ready to network. That's NeXT's designed target."

Because the machine runs a derivative of Unix, it will be able to share much of the technical and engineering software that runs on other Unix systems, which are prevalent in the academic world.

NeXT licenses Sun Microsystems' Network File System (NFS) to enable users to access files on Unix and other types of systems that support NFS.

Some analysts expect NeXT to license Apollo Computer, Inc.'s Network Computing System protocols also.

Using the computer's NFS electronic mail networking features, students can exchange messages with one another and with professors, Howard said.

Despite the inherent networking capabilities, Clare Fleig, director of research at International Technology Group, a management and computing consulting firm based in Los Altos, Calif., said she sees the computer designed first and foremost as an individual's computer.

"It's not really designed to be a work group-type computer," she said. "But it does have three expansion slots so that you could potentially include it in a group of networked machines."

No floppies allowed

Besides other advancements, the workstation features an erasable and removable 256M-byte optical disk drive from Canon U.S.A., Inc. that is capable of storing about 100,000 typed pages. But the computer does not accept floppy disks, which means software vendors will have to come out with programs on optical media or users will have to down-line load programs they want from a network server.

For ease of use, the workstation's NextStep software features a graphical user interface and an object-oriented applications development system that IBM has licensed for use with some of its workstations. NeXT is even ahead of Apple Computer in the use of its graphical interface, Millikin said.

"One of Apple's distinctions in the marketplace has been the user interface, and NeXT is eating Apple's lunch on that," he said of the company Jobs created and was later pressured to leave. "I think Jobs met one of his goals, which was to give Apple some pain."

As may be expected, some competitors have belittled Jobs' product.

William Gates, the founder of software developer Microsoft Corp., has said that there are no breakthrough features in the NeXT computer and that Jobs' colorful personality is the only reason the product is gaining so much attention.

NeXT, Inc.
miniprofile

Founded: September 1985
Founder: Steven Jobs

Primary product:
NeXT Computer System

Target market:
Universities

Operating system:
Variation of Unix

Price:
$6,500 for computer
$2,000 for laser printer

SOURCE: NeXT, INC., PALO ALTO, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

Sun Microsystems cofounder William Joy has expressed similar sentiments, and Apple Computer has been mute on the subject.

But more companies have lined up to shake Jobs' hand.

IBM lends its support

The most significant supporter has been IBM. It agreed to license NeXT's NextStep software so that it can provide users of its workstations running IBM's AIX operating system with a color graphical user interface and an application development tool kit.

Analysts expect that IBM will use the NextStep software with all of its workstations designed for the government and education markets and use Microsoft Corp.'s OS/2 Presentation Manager for its Personal System/2s and other workstations intended for other markets.

Unless NeXT changes its mind about selling its computers outside of the university community, this will be about the only way business users will have access to NextStep's features, analysts said.

Other companies that have signed agreements to support NeXT with software include Adobe Systems, Inc., which is developing versions of its drawing program and typeface library for the NeXT system, and Sybase, Inc., whose Sybase SQL Server — a relational data base management system — will be bundled with every NeXT system. Frame Technology Corp., a maker of publishing software, also said it will support the machine with software.

Analysts are not sure how well the NeXT computer, which sports a $6,500 price tag and comes with an optional $2,000 laser printer, will sell in the university environment, where companies such as Sun Microsystems, Apollo and Digital Equipment Corp. have already made deep inroads. The NeXT computer, however, is significantly less expensive than machines from those competitors, analysts said.

Nevertheless, the product has the potential to be a strong seller, Fleig said. "The marketing strategy is interesting in that it is limited to universities," she said. "It could become a sought-after cult machine because sometimes the more difficult something is to get, the more people are interested in getting it."

RBHC funneling of calls unfair

continued from page 11

Today, customers who want to access a carrier other than AT&T from a pay phone must dial an access code. Greene said the Consent Decree specifically mandates that the RBHCs offer access to all long-distance carriers without the use of such codes. The technology necessary to make that possible is under development but will not be available for two to three years.

In the interim, Greene ordered that the owners of premises that have pay telephones should survey phone users beginning in January 1989 to determine which carrier they prefer. Once that determination has been made, all long-distance calls dialed as 0+ calls from those telephones will be routed to the selected carrier.

One of the problems with calling cards has arisen because RBHC customers are allowed to charge long-distance calls to their home accounts. The RBHCs have discriminated in favor of AT&T, Greene said, by refusing to provide information necessary to determine the validity of RBHC cards and those of other long-distance carriers.

Greene noted that other carriers are effectively prevented from accepting charges made using RBHC calling cards because if a long-distance call is made using a fraudulent RBHC calling card, the interexchange carrier is denied payment.

Greene said the RBHCs were warned in a January opinion from the Department of Justice that refusing to supply validation data violated the Consent Decree. He said that only US West, Inc. and Pacific Telesis Group have provided validation data or services to date.

However, spokesmen from both Bell Atlantic Corp. and Ameritech said their companies have offered validation data to interexchange carriers since March and April, respectively. Greene has ordered that all RBHCs must make calling card validation data available by Jan. 1, 1989.

Another RBHC calling card problem Greene cited was the printing of AT&T's international number (used to make international credit card calls) on the back of RBHC cards. Greene ordered the RBHCs to either recall cards bearing the AT&T international number or recall only those cards assigned to non-AT&T customers and replace them with cards bearing the international number of the caller's chosen long-distance company.

In response to the other elements of Greene's order, many of the RBHCs said they were still studying the ruling and could not issue detailed statements on how they would comply.

AT&T representatives said the ruling did not come as a surprise and that AT&T supports equal access efforts.

Breakthrough for MCI

MCI Communications Corp., which has long sought equal access to calling card and pay telephone services, said that Greene's ruling was a breakthrough. "We've really been competing with one hand tied behind our back," said Roy Gamse, vice-president of marketing at MCI.

Until now, "AT&T has gotten two bites of the apple" on calling

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An integrated network management

cards because it got the long-distance traffic whether a customer used an AT&T calling card or an RBHC card, Gamse said.

"The RBHC cards are really just AT&T cards in disguise," he added.

Although Gamse declined to provide any market figures, he said Greene's ruling should give MCI calling card operations a boost. In particular, a new MCI calling card campaign tailored to large business users may benefit from the ruling, he said.

The new card program will allow companies to customize the card with their logo and colors, Gamse said. This should help companies promote consistent employee usage, he said, because the card will be seen as the company's calling card and not just another card from a long-distance provider.

Users of the MCI business calling card will also be allowed to charge long-distance calls from any phone in their local calling area without paying the 55-cent surcharge normally assessed on all calling card transactions, Gamse said. He said AT&T collects an 80-cent surcharge for any calling card call even if it is placed from a phone within the customer's local calling area.

The third new feature of MCI's calling cards for businesses is Invoice Management Reports, a software package for IBM Personal Computer compatibles that allows users to track and manage calling cards issued within a company.

The system is currently in testing and is scheduled for release in the second quarter of 1989. Gamse said the software may be provided to MCI business calling card customers free of charge.

AT&T user withdraws its praise

By Rex Bowman
West Coast Correspondent

ROBINSON, Ill. — Candy bar maker L.S. Heath & Sons, Inc., which once publicly promoted AT&T's products, is now spreading the word that AT&T is "not the right choice" after all.

Heath recently delivered a press release in which it said that communications and computing equipment AT&T sold the company in 1984 did not perform as promised.

The release also stated that Heath is suing AT&T in Illinois' 18th Judicial Circuit Court in Wheaton to recover $6 million in damages stemming from problems with the equipment.

A source of embarrassment

Heath said the AT&T equipment has been a source of embarrassment for the candy and ice cream manufacturer. In 1984, after the company spent $450,000 to buy AT&T 3B minicomputers, a System 75 private branch exchange and numerous terminals and printers for its offices and factory here, the company agreed to participate in a television and print advertising campaign that AT&T was conducting.

That campaign featured a number of AT&T customers giving glowing reviews of AT&T's voice/data solutions.

In one promotional video Heath did for AT&T, a Heath executive declared, "It doesn't help much to learn from yesterday's floppy disk that we shipped a million candy bars that were each overweight by one-tenth of an ounce. We need to know when the specs are off so we can take action right away."

According to the suit filed by Heath in the Illinois Circuit Court, the equipment AT&T sold the company has been no help at all in spotting overweight candy bars.

Specifically, the suit alleges that the equipment will not work with Heath's IBM equipment, contrary to AT&T's promises; the AT&T equipment did not have the ability to do things the AT&T salesman said it could; and many of the promised applications were never brought on line.

The undelivered applications include order processing, inventory control and electronic data interchange with Heath's trading partners, the company said.

Heath is asking for $6 million in damages, based on $2 million in unachieved gains in productivity, $1 million spent in trying to make the systems work, $1 million for additional equipment and the $450,000 it originally spent to buy the equipment. The extra $1.55 million will pay lawyers' fees and other legal costs.

Others empathize

Several AT&T customers have called Heath to empathize, according to James Hartrich, manager of data processing at Heath.

"I don't know if they did advertisements [for AT&T]," Hartrich said, "but they called to say we are not the only ones having problems with AT&T."

An AT&T spokeswoman said the company would not comment on the matter.

Judge delays hearing on fire suit against Ill. Bell

By Wayne Eckerson
Staff Writer

CHICAGO — A Cook County Court judge recently postponed a hearing on an Illinois Bell Telephone Co. motion to dismiss a suit filed by customers who lost service when a fire destroyed a major switching center near here in May.

In a related matter, the Illinois Commerce Commission (ICC) recently postponed the release of a final report on the cause of the fire at the Hinsdale central office.

Judge Roger Kiley Jr. was to begin hearing arguments on the Illinois Bell motion last week but postponed action until Oct. 28.

In the motion, Illinois Bell claimed it is protected from punitive lawsuits under tariffs filed with the Federal Communications Commission. Illinois Bell claims its only responsibility under the tariffs is to refund payments for the period of time customers were without telephone service.

The suit, involving a dozen plaintiffs, maintains that Illinois Bell violated an Illinois Public Utilities Act provision that requires public utilities to provide adequate, efficient and reasonable service to their customers.

The suit, which is being handled by the law firm DiTommaso & Berman, based in Oak Brook, Ill., claims that Illinois Bell was negligent in failing to respond quickly to the fire. The suit also alleges that the carrier did not provide adequate fire suppression equipment or alarm systems, did not sufficiently staff the Hinsdale office and did not provide proper backup switching equipment, among other things.

The class action suit must survive the Illinois Bell motion and be certified as a class action suit before a trial can begin, said Vincent DiTommaso, the chief attorney for the plaintiffs.

He estimated that the suit, once certified, could involve in excess of 40,000 claimants.

DiTommaso, speaking at a telecommunications disaster recovery conference held in Oak Brook last month, said Illinois Bell would have to pay punitive damages to the suit's claimants if it was proven that Illinois Bell acted negligently.

> The suit could involve over 40,000 claimants.
>
> ▲▲▲

"If we win, Illinois Bell will have to pay a sum of money large enough to hurt the company. That is what punitive damages are meant to do," he said.

ICC report

By the end of the month, the ICC will set a new target date for the release of the report on the Hinsdale fire, said Albert Talbott, chief telephone engineer for the ICC. Talbott projected that the final report will be issued sometime before the end of the year.

"We want to make sure that we do a thorough investigation. We do not want to force the completion of the investigation and risk not examining all the possible questions people might have about the origins of the fire," Talbott said.

The ICC and the Illinois fire marshal have hired Forensic Technologies International Corp. of Rockville, Md., to conduct the investigation. A preliminary report issued this summer said that the fire had not been deliberately set but that its origins were still unknown.

Other independent groups are conducting investigations into the fire, including Illinois Bell's liability insurer, Factory Mutual Co., according to ICC Assistant General Counsel Edward O'Brien.

When asked whether the ICC is postponing its final report until Judge Kiley rules on Illinois Bell's motion, O'Brien said there was no connection between the two.

"I am not even aware of the timetable in the courts," O'Brien said. "There is absolutely no relationship between our investigations and the civil suit against Illinois Bell."

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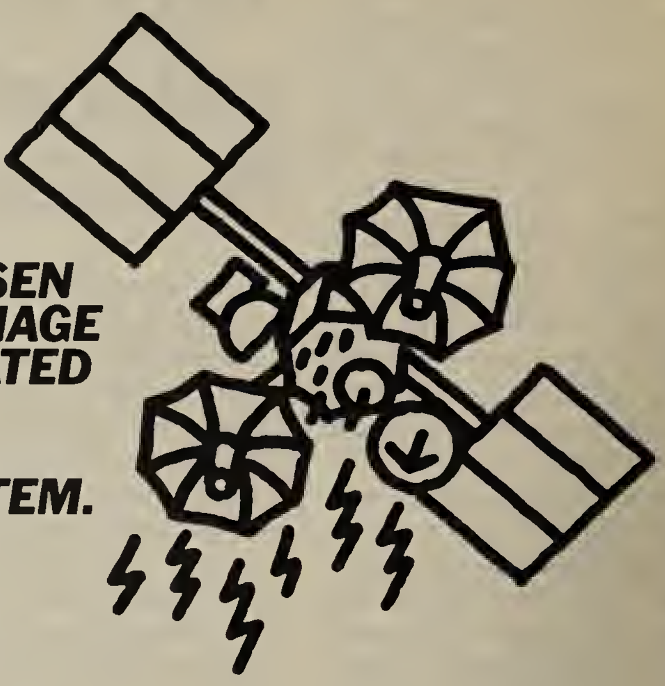

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Worth Noting

"Management must look at training as an investment, not a cost. And managers have to stop justifying training programs in terms of dollars and cents."

Paul Hardt
Training manager
I.C. System, Inc.
A Vadnais Heights, Minn.-based
consulting group
specializing in training
communications staffs

Carrier Watch

AT&T last week began offering Fax First, a service that allows customers to send and receive facsimile copies from any AT&T Phone Center.

Facsimiles can be transmitted between Phone Centers or to any compatible facsimile machine around the world.

AT&T operates 425 Phone Centers in the U.S. When a customer sends a facsimile from one Phone Center to another, an AT&T representative will notify the intended recipient by telephone that he can pick up the facsimile at the Phone Center store.

Customers can send as many as five pages within the U.S. for a flat fee of $7.50. Additional pages cost $1 each. Customers sending facsimiles to other countries will pay a flat fee of $9.50 for the first five pages and $1 for each additional page.

Ameritech Mobile Communications, Inc., of Southfield, Mich., is giving up its 5,500-sq.-ft. Southfield office to move into a 21,000-sq.-ft. office in Farmington Hills, Mich.

The move, which is expected to be completed in January 1989, marks the third time in the last four years that the company has outgrown its office space, according to Ameritech Mobile Communications.

Ameritech Mobile Communications, which provides cellular phone service to customers in the Detroit area, is tripling its current operations staff. ■

AT&T shaves rates, resets WATS prices

Switched service rates cut by $697m, carrier also proposes merging 3 Pro WATS services.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — As expected, AT&T last week slashed switched service rates by $697 million and restructured its WATS calling plan.

The rate cuts — which affected everything from Reach Out America to Megacom 800 — represent a 3.8% average reduction overall, the brunt of which affects long-distance calls of 125 miles or longer. Rates for shorter interstate calls — one-fourth of all AT&T calls — were less affected.

Rates for Pro WATS I, Pro WATS II and Pro WATS III (formerly known as Pro America services) will be reduced overall by 3.8%. The company also proposed merging these three services into a single rate schedule, dubbed Pro WATS, effective Dec. 1, the date the new rates will go into effect if approved by the Federal Communications Commission.

AT&T asked the FCC to approve a 4.7% price cut for AT&T Megacom WATS (formerly called Megacom), a 4.8% reduction for AT&T Megacom 800, a 4% overall reduction for basic AT&T 800 Service, a 3.6% cut for 800 Readyline service and a 6.2% reduction for Software-Defined Network service.

Also in its filing, AT&T said it will shear 4.9% off the price of Reach Out America, a long-distance calling plan for residential customers.

In the tariff filing, AT&T announced it will do away with its banded WATS pricing plan in favor of a mileage-based rate schedule ("AT&T to cut switched service rates," *NW,* Oct. 17).

WATS rates are currently calculated using geographic service bands. A user that buys Band 1 lines to deliver calls to nearby cities can not use those same lines to pass calls to locations outside

(continued on page 18)

WASHINGTON UPDATE

BY ANITA TAFF

Tariff 15 continues to make waves. The Federal Communications Commission's ultimate decision on the legality of AT&T's Tariff 15 may bring about fundamental changes in the way common carriers are regulated, said Gary Epstein, former chief of the FCC Common Carrier Bureau, who spoke at a meeting of the Federal Communications Bar Association last week. Epstein is an attorney with Washington, D.C. law firm Latham & Watkins.

He described the current regulatory environment, in which different rules apply to dominant and nondominant carriers, as a "half-loaf theory of deregulation."

Although many of the problems created by this regulatory structure are almost insurmountable, Epstein said, "I don't subscribe to the theory of immediate deregulation of AT&T because there's nothing else to do." He said he is not ready to "turn out the lights of the Common Carrier Bureau and close the door."

Meanwhile, the legal battle over Tariff 15 continued as both AT&T and the FCC asked the U.S. Court of Appeals to dismiss MCI Communications Corp.'s appeal of the commission's decision on Tariff 15. Both AT&T and the FCC claimed that the decision allowing Tariff 15 to go into effect while it is investigated is not a final order and therefore cannot be appealed.

The FCC added that even though MCI and others might suffer some harm during the time the tariff is in effect, the decision cannot be reviewed by a court at this point.

Three other groups, describing themselves as interested parties, also asked the court for permission to intervene in the case at a later date. US West, Inc. and Ameritech both said that their local exchange companies could be affected by any court decision reversing the FCC order on Tariff 15. Contel ASC said that because it offers services that compete with both AT&T and MCI, its interests would also be affected by any ruling. ■

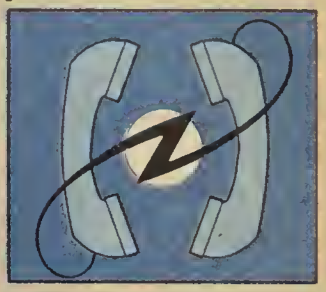
Midwestern Telecommunications Conference

Held: Oct. 10-13, Minneapolis
Attendance: 400 (approx.)
Exhibitors: 95
Seminars: 32

Seminar topics: education and training, customer premises equipment maintenance contract negotiations, telemanagement systems, long-distance voice services, T-1, VSATs, ISDN and local-area networks

Users groups represented at the conference included:

- ☐ Indiana Telecommunications Users Association
- ☐ Iowa Telecommunications User Group
- ☐ Michigan/Ohio Telecommunications Association
- ☐ Minnesota Telecommunications Association
- ☐ Wisconsin Telecommunications Association
- ☐ Mississippi Valley Telecommunications Association



SOURCE: MINNESOTA TELECOMMUNICATIONS ASSOCIATION, MINNEAPOLIS
GRAPHIC BY SUSAN J. CHAMPENEY

Telecom group offers tips for managing nets, staff

Meeting touched on making pacts, stress mgmt.

By Bob Wallace
Senior Editor

MINNEAPOLIS — The Midwestern Telecommunications Conference — a meeting of 400 users from nine users groups — met here recently to discuss voice network operations, key management issues and important "soft" skills.

This year's conference featured 32 seminars on topics ranging from comparing long-distance rates to stress management. Featuring 95 exhibitors, the meeting lasted for three days.

Conference speakers — consultants who specialize in certain practices — gave attendees advice on how to manage their nets, resources and staff.

One seminar speaker, Lillian Goleniewski, president of The LIDO Organization, a Mill Valley, Calif.-based communications consulting firm, advised users to proceed cautiously when hammering out private branch exchange maintenance contracts. "The single biggest mistake telecommunications managers make in negotiating contracts is not putting everything in writing," she said.

"There are far too many handshakes and gentlemen's agreements on items that should be spelled out in the maintenance contract," Goleniewski added.

Goleniewski, a certified technician for Intecom, Inc.'s IBX PBXs, said increased dependence on telecommunications systems means users must specify service levels and contractual obligations for all service contracts.

Faster work-force turnover, proliferation of digital switching and transmission technologies and an increase in the amount of data switched through PBXs have reduced service stability. Large users have responded by forming internal operations groups, Goleniewski said. "In-house alternatives will generally reduce service expenses by 20% to 50%," she added.

In addition to this presentation, Goleniewski led a session on telemanagement systems — products used to identify calling costs, track inventory (including wiring and telephones) and simplify the often arduous problem-isolation and resolution process.

Assessing the cost of setting up and running staff training programs can also be a difficult task. Paul Hardt, training manager for I.C. System, Inc., a Vadnais Heights, Minn.-based training firm, told users that training costs include trainer salaries, the cost of training materials and the cost of renting meeting space.

"When trainees are on the system, they're tying up valuable resources," Hardt said.

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Hardt said users should also consider the cost of computer time because some training programs specify use of computers. "When the trainees are on the system, they're tying up valuable resources," he explained.

The user may also have to shoulder what Hardt called replacement costs — the expense of paying for fill-ins while end users are being trained.

Cost-justifying a training program takes some creativity, Hardt said, explaining that, "Sometimes the best way to cost-justify training is to use a night-

(continued on page 18)

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Telecom group offers tips

continued from page 15

mare or disaster situation." Hardt suggested that users explain to management that if telephone system hardware is installed incorrectly, the new branch office may come on line late. "The result could be lost revenue and a reduced level of customer service," Hardt said.

David Knox, a consultant specializing in detecting stress, offered users tips for detecting and managing stress — a so-called "soft" skill. "Employees complaining of headaches, insomnia or stomach and back pains may be under a great deal of stress," Knox said. Workers suffering from unusually long colds may also be stressed, he added.

Knox said employees of merged, acquired or sold companies spend too much time worrying about how they will be affected by these events. "I've had some employees tell me they spend 50% of their work time protecting their job. That's exactly how you get yourself fired — for not spending enough time on your actual job," he said.

"There are too many people spending too much time worrying about what will become of their job," Knox continued. "The ulcer is not a result of what you're eating — it's [a result of] what's eating you." ◼

AT&T resets WATS prices

continued from page 15

of the Band 1 region.

The AT&T spokesman said the change in AT&T WATS billing will mean lower service costs for most AT&T WATS users, no change for a few customers and a slight increase for a small percentage of users.

The carrier filed for two new volume discounts for AT&T WATS. Users that spend $200 to $2,000 a month on the service will receive a 10% discount on day rates. Users that spend more than $2,000 a month will receive a 15% day rate discount.

AT&T is also planning to provide current AT&T WATS users with WATS Call Detail Reports. Hard-copy reports are already available, and call-detail data in tape form will become available next month. The reports carry a onetime charge of $54.

Industry analysts said the rate cuts will help AT&T meet stiff competition for WATS services.

One consultant, Robert Self, president of New York-based consultancy Market Dynamics, said he expects AT&T will try to slowly move average WATS users to the Pro WATS services.

Self pointed out that AT&T WATS requires WATS access lines, while Pro WATS I, Pro WATS II and Pro WATS III use regular — and generally less expensive — local access lines. Further, WATS access lines can be used to carry WATS traffic only to a specific geographic region, whereas regular access lines can be used to carry calls to almost any U.S. address, Self said.

Users that spend more than $2,000 a month will receive a 15% day rate discount.

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"With the Pro WATS services, the user acquires regular access lines directly from the BOC. AT&T is not involved," Self said. "[AT&T does not] want to be in the access-provisioning business."

At press time, neither MCI Communications Corp. nor US Sprint Communications Co. — AT&T's two biggest rivals — had pledged to match the AT&T rate cuts, but both carriers said they were studying the AT&T filing.

AT&T has become far more aggressive in marketing long-distance services, according to Self. "They've taken a huge number of skilled operations group workers and trained them to sell long-distance services," Self pointed out. In September, AT&T said it would cut 6,000 jobs from its Network Operations Group by 1990, and many of those employees would be offered sales positions ("AT&T unit plans to cut 6,000 jobs," *NW*, Sept. 12).

The AT&T spokesman said the carrier has cut long-distance service prices by $8 million, or 38%, since divestiture, a figure that includes rate reductions for dedicated and switched offerings. This latest reduction is AT&T's seventh in the last five years. The most recent rate cuts took effect in January and dropped prices by $772 million, he added. ◼

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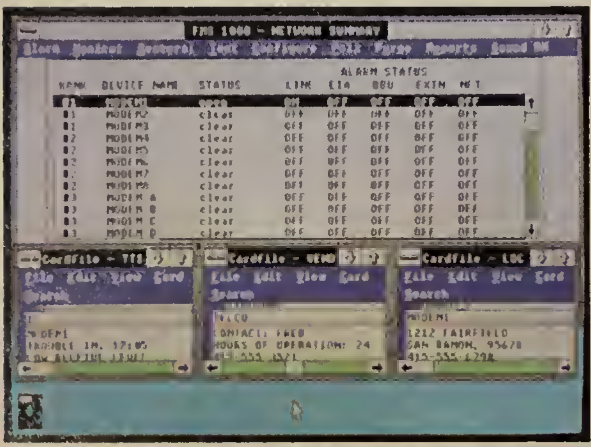

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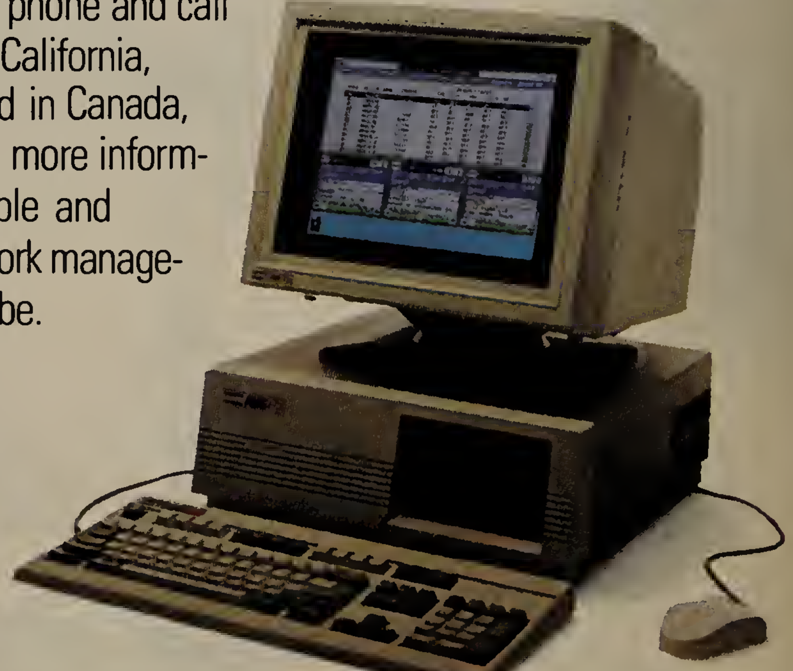

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "When you can afford the luxury of large inventories, you don't need instantaneous information. But today, we're looking at just-in-time [inventory management]. We need to do things in hours instead of days or weeks or months."
>
> **William Strowbridge**
> Vice-president of management
> information resources
> Dataproducts Corp.
> Woodland Hills, Calif.

Data Packets

Pan American Satellite (PAS) of Greenwich, Conn., won final approval earlier this month for offering what the company says is the first private satellite system between U.S. and European users.

The International Telecommunications Satellite Organization Assembly of Parties gave the green light to the project, following an earlier determination by the INTELSAT Board of Governors that the PAS system was technically compatible with and would cause no economic harm to the INTELSAT system, according to the PAS announcement.

Assembly approval gives PAS "landing rights" in Europe, giving users there and in the U.S. access to Ku-band services on the PAS satellite launched last June. PAS is the first U.S. satellite system to compete with INTELSAT internationally, the firm said.

The PAS satellite has 24 transponders in both Ku- and C-band. In addition to the U.S. and Europe, the system covers the Caribbean and Central and South America. PAS offers subscribers such services as full- and part-time video, low- and high-speed data circuits, broadcast data network, private voice, electronic mail, facsimile and business television.

(continued on page 22)

Backup service nabs data while it's being created

Up-to-date information is then stored off site.

By John Cox
Senior Editor

NEW YORK — Televault Technology, Inc. (TVT) announced recently a data backup service that automatically captures data and ships it over high-speed network links for storage in an underground "electronic vault" here.

The service, dubbed Televault, captures corporate data as it is being created. If a customer's data center fails, Televault can retransmit the data to a backup data center maintained either by the customer or by a third-party disaster recovery firm, according to Joel Shapiro, president of TVT, which is headquartered in Arlington, Texas.

Companies within an 80-mile radius of New York transmit data over a T-3 fiber-optic link leased from Teleport Communications-New York, based here. Users in other areas access the electronic vault using T-1 service from long-haul carriers, Shapiro said. TVT plans to open other vaults in major U.S. cities.

The new service is aimed at large corporate users, such as financial services companies, with massive amounts of data that changes frequently during the day. Shapiro cited a study by the University of Texas at Arlington in which, he said, one respondent estimated the loss of a single day's data would cost the company $400 million.

For such companies, he said, "televaulting" will be a welcome replacement for the traditional data backup method in which tapes are delivered to a secure storage site.

A TVT software package running on a customer's IBM mainframe works with the before-and-after record image, called a log or journal, created by IBM programs such as CICS in updating a data base record or VSAM file, Shapiro explained. A device called a fiber-optic channel extender attaches by a bus-and-tag connection to the mainframe communications channel and converts the channel signal into lightwave.

Data is transmitted to TVT's underground vault at the World

(continued on page 25)

New service merges ACH, check-cashing functions

By Wayne Eckerson
Staff Writer

SAN FRANCISCO — Bank of America National Trust & Savings Association and Cashex, Inc. recently announced an agreement to provide a service that will enable retail merchants to debit customer bank accounts or verify their checks from the point of sale.

The companies are planning to help retailers add or install the equipment needed to support the automated clearinghouse (ACH) debit card service. They will also assist in marketing the service to store customers, said Douglas Easters, president of Cashex.

A progressive move

Cashex, a wholly owned subsidiary of Nashville-based Comdata Holdings Corp., already operates a network of about 4,500 payment terminals that provide a variety of check-authorization services for supermarkets and other retailers.

For Bank of America, the move is an attempt to bolster its position in the debit transaction business against traditional rival Chase Manhattan Bank, N.A. and debit card newcomer Citibank N.A. Bank of America currently handles debit transactions for the Vons Grocery Co. supermarket chain based in El Monte, Calif.

Access to retailers

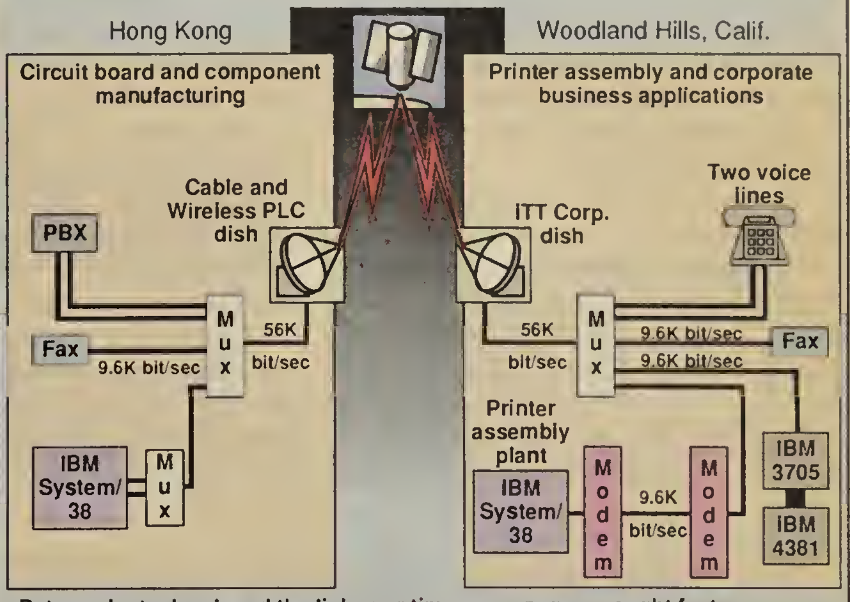
The alliance gives Bank of America access to merchants who have installed Cashex check payment systems and want to add debit service. It also lets the company reach retailers who may want to develop check verification or debit card systems from scratch, according to Stephen Ernst, vice-president at Bank of America.

"Cashex already has a sizable customer base and many of [those customers] will want to to add ACH [debit card] service to their existing systems," Ernst said.

The debit card service will enable retailers to issue their own debit cards and pass off the transactions at the end of the day to Bank of America, which will process them in ACH fashion. Most other debit cards are issued by banks and used in on-line networks, meaning customer accounts are debited at the time of the sale.

(continued on page 25)

Dataproducts' satellite link



Dataproducts developed the link over time as managers sought faster access to more data.

SOURCE: DATAPRODUCTS CORP., WOODLAND HILLS, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

Shakeup in industry brings strategy shift

Dataproducts' forthcoming satellite link marks a new era in communications for the company.

By John Cox
Senior Editor

WOODLAND HILLS, Calif. — Dataproducts Corp. is scheduled to cut over an international satellite link next week that reflects the company's strategy to use networking to better its competitive stance in the printer market.

The new link will speed up the exchange of information about manufacturing schedules, inventory and accounts receivable between Dataproducts' headquarters here and its Hong Kong manufacturing plant.

Every bit of this information is seen as critical in the printer maker's effort to adapt to a market that has changed as dramatically as it has shrunk in the last five years, according to William Strowbridge, vice-president of management information resources for Dataproducts.

In the mid-1980s, the computer peripherals industry was in turmoil. Dataproducts' annualized sales fell from about $500 million to about $350 million.

As the industry grew smaller, it also transformed, Strowbridge said. Management, under the leadership of new Chairman and Chief Executive Officer Jack Davis, realized the company needed to respond much more quickly to market conditions and customer requirements.

Shorter product development cycles were now a permanent feature of the industry, Strowbridge said. Faster response went hand in hand with the need for more efficient use of resources.

"These are communications issues," Strowbridge said.

This realization encouraged the company to upgrade the dial-up international services it had been using to an international voice-grade leased line and then, most recently, to upgrade to a 56K bit/sec satellite link.

The new link will enable Dataproducts to attack one of its most pressing issues — minimizing inventory while remaining responsive to customer and market

(continued on page 22)

The Dataproducts plan

Now
- One Ethernet for engineering (VAX systems)
- One Ethernet for computer-aided design (VAX)
- Sun Microsystems, Inc. net for software laboratory
- IBM mainframe for business computing and remote-site operations
- Satellite links to oversea plants
- All systems separate from one another
- Main processors and servers recently centralized in one computer room

Future
- SNA network with 16M bit/sec token rings for business computing and product test/design
- Ethernets linked by bridges to integrate systems for engineering, software lab, CAD, shop floor/manufacturing, technical documentation and facilities planning
- SNA-Ethernet gateway linking both environments

SOURCE: DATAPRODUCTS CORP., WOODLAND HILLS, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

Shakeup in industry brings strategy shift

continued from page 21

needs, he said. The 56K bit/sec satellite link, leased from ITT Corp. and accessed via a domestic land line, will support two voice-grade circuits, a 9.6K bit/sec circuit for facsimile transmission and two full-duplex 9.6K bit/sec data circuits, one for interactive terminal traffic and one for batch transfer of large files.

The new link will support interactive traffic between the company's IBM mainframe and minicomputer systems here and an IBM System/38 in Hong Kong, giving the California staff access to Hong Kong's manufacturing schedules and inventory data.

Hong Kong will be able to adjust more quickly to changing engineering orders and, as a result, accurately predict manufacturing workloads and their potential impact on delivery dates. And all of this will take place weeks faster, according to Strowbridge.

So far, the satellite link is the most visible achievement in the company's strategic plan to centralize data and resources, provide better access to the resources and eliminate redundancies.

Dataproducts followed the same route when it decided to centralize accounts receivable at its headquarters. Previously, Hong Kong and the U.S. billed customers separately, leading to duplications and inequities, Strowbridge said.

Centralizing this work eliminated those problems and let Dataproducts handle a 30% to 40% jump in order transactions without adding staff, he said.

The new overseas line is only one part of a five-year strategic plan to integrate four distinct network environments at the company's campus headquarters.

The corporate mainframe, housed in a central computer room to support business and financial applications, talks with overseas terminals and computers in Hong Kong and Dublin, Ireland.

The computer room also houses a VAX 6220, which serves electrical design engineers in a separate engineering building via an Ethernet link. Another Ethernet joins three VAX 750s in the computer room to terminals, workstations and a Hewlett-Packard Co. HP 330 at the engineering site.

"Connectivity is a nightmare," Strowbridge said.

▲▲▲

That building houses a pair of Apollo Computer, Inc. workstations on an Apollo network, which in turn links with the VAX-HP Ethernet. Separately, two Sun Microsystems, Inc. workstations, also at this location, are linked to a Sun server in the computer room. Next month, the company will begin installing a Prime Computer, Inc. network linking a Prime 4050 minicomputer to Prime microcomputers and scanners in two locations.

The main focus of the Prime system will be to allow the same set of engineering drawings to be used not only for design work but also in preparing technical documentation, product catalogs and shop floor assembly instructions. Currently, engineers create a design drawing that must be redrawn by employees in each of the other groups.

Eventually, all four Ethernets will be connected by bridges to form a single network. A gateway will link the Ethernet environments with a planned IBM Systems Network Architecture net. That net will comprise two IBM 9370s and several smaller systems and microcomputers that will be used in product testing and design.

The integration will not be easy. "Connectivity is a nightmare. You feel your way one step at a time and hope you don't stub your toe too many times," Strowbridge said.

But Dataproducts can not afford to wait for the computer vendors to present a neat package all wrapped up with a ribbon.

"We must move today," Strowbridge said. "Hopefully, the technology will catch up with us." ▣

Data Packets

continued from page 21

Timeplex, Inc. recently inked an OEM agreement with **TouchStone Software Corp.** to incorporate the latter's PCWorks software on the Timeplex L3100 network.

With the software, microcomputer users on an L3100 net will be able to talk directly to other networked microcomputers and data bases just by selecting the address of the destination from a menu. User-initiated host access and terminal emulation is also provided automatically, according to the company. PCWorks provides communications via an RS-232 port. The software has been customized to provide what both companies said is a transparent connection between the microcomputer user and the Timeplex network.

The Timeplex PCWorks software is priced at $195 and is available for delivery with the L3100 system. Timeplex is a subsidiary of Unisys Corp. ▣

Air France awards private net contract to McDonnell Douglas

By Rex Bowman
West Coast Correspondent

HEMEL HEMPSTEAD, England — Air France has awarded the French division of McDonnell Douglas Information Systems International Co. a multimillion-dollar contract to build an international data network for the French airline.

McDonnell Douglas beat out numerous rival bidders, including IBM, Northern Telecom Ltd. and BBN Communications Corp., for the contract, the value of which was not disclosed.

According to Raymond Challis, director of network systems for McDonnell Douglas Information Systems International, based here, the company will initially provide Air France with 20 Tymnet packet switches that will be used to link between 500 and 1,000 remote Air France terminals to its data centers in Paris and Valbonne, France.

"The initial rollout will attack some of the problems [airlines] have in the peak travel seasons," Challis said.

The initial terminal links, which will be operational sometime in the spring of 1989, will support ticket reservation centers in as many as 10 cities in the U.S. and Europe. T-1 multiplexers may eventually be added to the network to allow high-speed data transmission between Paris and Valbonne.

Ultimately, the network could include as many as 400 packet switches, linking 20,000 Air France terminals in 60 countries, Challis said. The switches would also be used to connect personal computers to Air France's mainframes around the world.

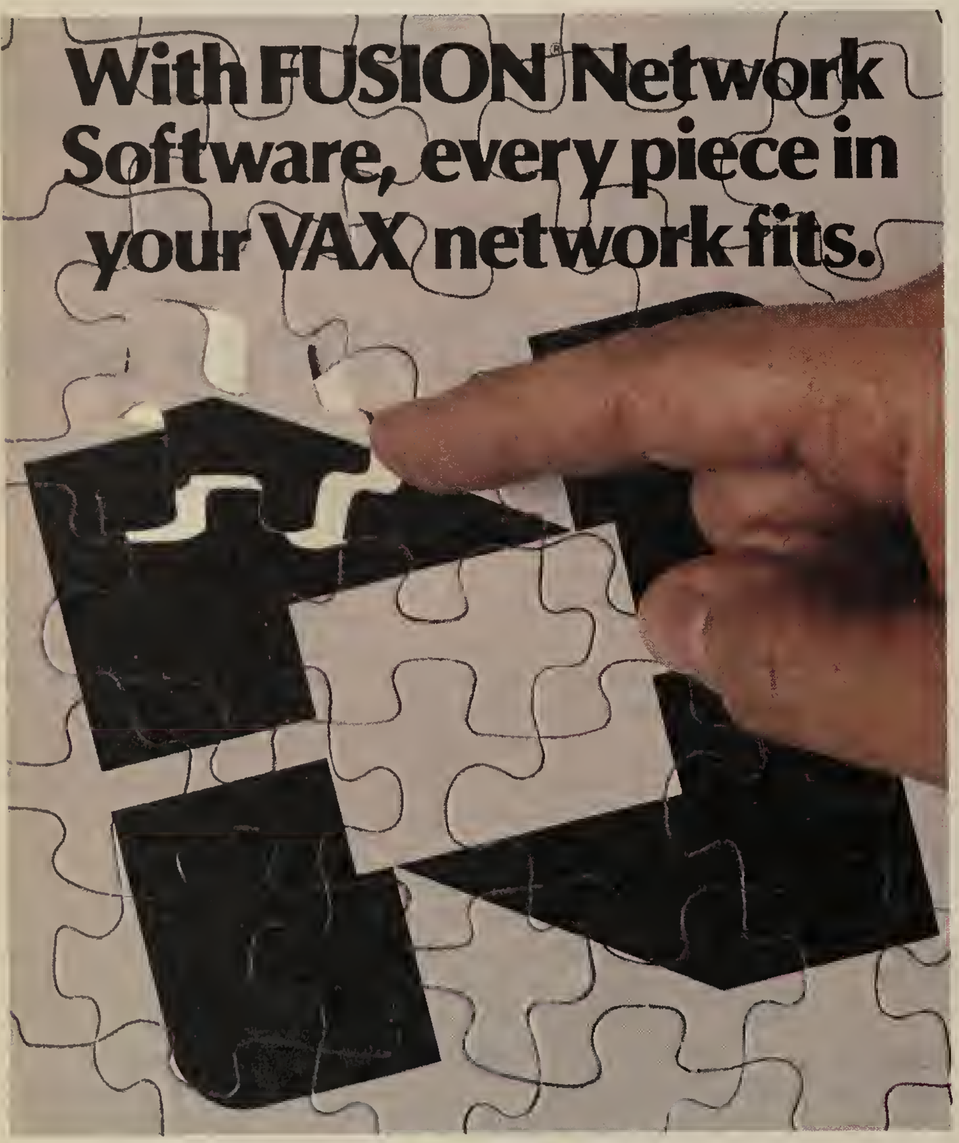
The data carried on the network will include information on reservations, flight schedules, maintenance, cargo and employee pay. McDonnell Douglas will manage the network for Air France.

Air France uses host processors from IBM, Digital Equipment Corp., Unisys Corp. and Honeywell Bull, Inc. The network will use both the proprietary communications protocols of the vendors and the proprietary communications protocols Air France uses in its reservation network.

The ability to network multivendor systems was one of the reasons Air France chose McDonnell Douglas, Challis said. Originally, more than 10 vendors bid for the contract, but the field was narrowed to just McDonnell Douglas and IBM before the airline selected the Tymnet network.

Air France will continue to operate its leased line data network during the initial phases of the Tymnet cutover, but the Tymnet data network will eventually replace the current network.

Air France could not be reached for comment. ▣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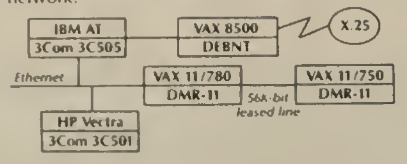

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Service nabs data while it's created

continued from page 21

Trade Center, where it is stored on IBM 3480 cartridge tape drives, Shapiro said. In the near future, he said, TVT will add high-end IBM 3380-class disk storage, with capacities of multiple gigabytes.

A separate TVT software package, called Programmed Automatic Recovery 1 (PAR 1), is designed to automatically perform a number of data restore and recovery operations, he said. It can be used with or without the Televault service.

PAR 1 records a variety of information needed to quickly restore data center operations, he said. In the event of a data center disaster, PAR 1 uses this record to bring up the customer's operating system at a backup site. It also activates the data bases and applications desired by the customer. Without this software, the customer must perform all these operations manually, Shapiro explained.

When used with TVT's Televault records, PAR 1 can bring up data bases at the hot site and update them with information saved up to the moment of failure, he added.

"In the past, people used what we call CTAM, the Chevy Truck Access Method," according to Shapiro, who previously worked with US Sprint Communications Co. and MCI Communications Corp.

The drawbacks of the so-called CTAM method were dramatically illustrated, Shapiro said, when a courier from a vault service picked up a load of tapes from one of its New York customers. The box of tapes slipped out of the back of the truck onto the middle of the West Side Highway, unbeknownst to the driver. The customer's first inkling of a problem was when a New Yorker delivered 20 tape reels carrying the company's name to its reception desk, he said.

"We use physically remote devices that appear local to the customer's mainframe environment," he said.

No changes need to be made to the mainframe operating system or the customer's communications software in order to use the Televault service, he said.

The base price of the Televault service is in the range of $10,000 to $15,000 per month, Shapiro said. The price is based on such variables as the number of channels and tapes, he said.

He asserted that the company's fees "are not that out of line with what storage costs." The premium charged by the company is justified in customers' eyes because of the security offered by the fiber link, the fast data retrieval, the 24-hour availability and the protected underground site, Shapiro said. In addition, customers save money by not having to invest in their own drives, a librarian or floor space.

Costs are likely to prove a key criteria for companies evaluating the TVT offering, according to Steve Josselyn, program manager for systems and peripherals technology services at International Data Corp., a Framingham, Mass.-based market research company. Josselyn first learned of Televault from *Network World*. He cautioned that his comments were based on the reporter's description of the new service.

He agreed that few other comparable services are available, although some disaster recovery vendors are developing them.

Josselyn noted these companies typically charge yearly fees of $60,000 to $70,000 for their disaster recovery offerings. And the base monthly fee cited by Shapiro adds up to $120,000 annually, he noted. Josselyn said the PAR 1 recovery software "seems to cover all the bases" needed in a full recovery service.

TVT, a subsidiary of Total Assets Protection, Inc., is headquartered at 2301 E. Lamar Blvd., Suite 500, Arlington, Texas 76006, or call (817) 649-2715. ◘

Service merges ACH, check cashing

continued from page 21

Merchants are more likely to develop customer loyalty if they can issue their own cards, according to John Love, publisher of the biweekly newsletter *Bank Network News,* based in Chicago.

The two companies will advise merchants on how to design and issue ACH debit cards, maintain customer files and teach cashiers and customers to use the service. "We are confident that this jointly developed system will encourage merchants to invest in ACH systems for their stores," Cashex's Easters said.

According to Ernst, the product will be less expensive than on-line debit services and it will reduce requisite equipment because it combines two systems into one. Merchants currently need two separate terminals or one terminal with two separate network links to offer both types of service, he said.

Love agreed, saying, "The service simplifies things for retailers. Instead of hooking a terminal up to two different systems that may require two different interfaces, the new system provides one connection for both check authorization and automated clearinghouse debit transactions."

However, analysts doubted whether the new arrangement would increase the attractiveness of ACH systems to merchants or give merchants an advantage over competitors using ACH.

"Although the new system enhances ACH offerings to merchants, it doesn't give retailers a significant advantage over their competitors who are also using ACH," Love said.

"Bank of America and Cashex are not offering a completely new product. Their announcement represents a marketing and systems packaging breakthrough, not a revolutionary new product," he said.

Currently, only three retailers use ACH systems: Vons Grocery, Mobil Corp. and Exxon Corp. According to Love, these companies account for 500,000 ACH transactions a year. ◘

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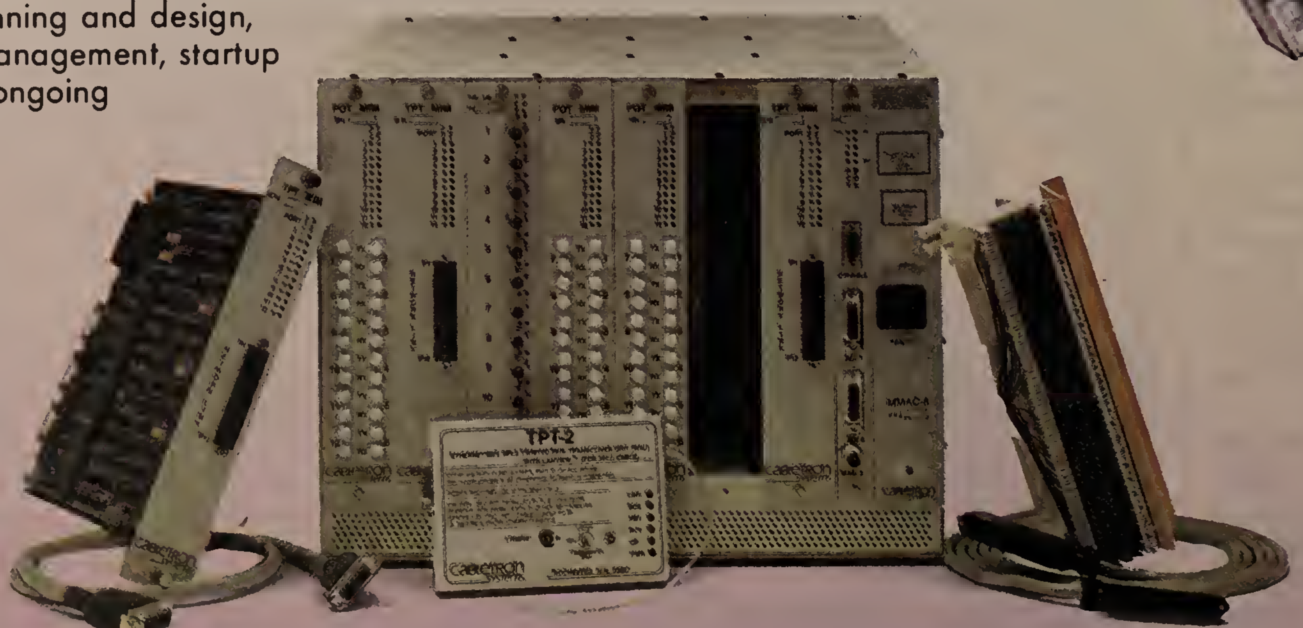

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> "The LAN industry is holding its breath waiting for IBM to announce whether 4M or 16M bit/sec Token-Ring will be the standard for desktop computing. However, 16M bit/sec will be extremely difficult to do over unshielded twisted-pair wiring, and that could make a lot of users unhappy."
>
> **Phillip McDermott**
> Vice-president and general
> manager of LAN products
> David Systems, Inc.
> Sunnyvale, Calif.

Netnotes

The **TOPS Division** of Sun Microsystems, Inc. recently announced FlashBox, a device that links Apple Computer, Inc. Macintoshes and IBM Personal Computers over Apple LocalTalk and compatible networks at up to 770K bit/sec. The product is priced at $189 and will be available in December. FlashBox reportedly operates at three times the data transmission rate supported by Apple's AppleTalk networking system.

Sun's TOPS Division is located at 2560 Ninth St., Berkeley, Calif. 94710, or call (415) 549-5900.

Cisco Systems, Inc., a supplier of network bridges and routers in Menlo Park, Calif., has named John Morgridge president and chief executive officer. Morgridge joins the company after two years as president and CEO of Grid Systems, a manufacturer of portable computers that was acquired by Tandy Corp. last July.

SynOptics Communications, Inc. last week introduced an adapter that lets users connect Ethernets based on unshielded twisted-pair wiring with Ethernets utilizing existing thin coaxial cable.

Called the LattisNet Model 2600 Thin Net Adapter, the

(continued on page 28)

TOPS cites steady growth since acquisition by Sun

Shipments of company's operating system soar.

By Laura DiDio
Senior Editor

BERKELEY, Calif. — Since its acquisition by Sun Microsystems, Inc. early last year, TOPS has experienced rapid, albeit unobtrusive, growth.

Since June 1987, Sun's TOPS Division (formerly Centram Systems West, Inc.) has seen monthly shipments of its TOPS entry-level network operating system soar from 2,000 to more than 40,000 units, according to Richard Shapero, vice-president and general manager for the division.

Compared with the previous fiscal year, revenue has risen "by a factor of eight in fiscal 1988," Shapero added, although he would not specify the exact sales figures. TOPS' fiscal year ended June 30.

Equally important is the fact that TOPS is one of the few local network vendors that is currently gaining market share, according to analysts. TOPS is the market leader of network operating systems for the Apple Computer, Inc. Macintosh.

"We're bullish on TOPS," said Joseph Seidler, vice-president of consulting firm Infonetics, Inc. in Santa Clara, Calif. "They have a much larger installed base than people realize. Right now, it's about half a million nodes. And that's more than anyone except Novell [Inc.] and IBM."

Market leader Novell, whose NetWare network operating system accounts for about 55% of the market, has more than 2.2 million nodes installed. Network systems supplier 3Com Corp. boasts a 10% market share on the strength of its 200,000 network nodes, according to Seidler.

The difference between a TOPS network and those based on Novell's NetWare and 3Com's 3+ is that the Novell and 3Com networks require a server.

"The key difference between TOPS and the other LAN operating systems is that TOPS utilizes a distributed server architecture, whereas the others employ a central server architecture that requires files to reside on one de-

(continued on page 57)

3Com net control tools for OS/2-based 3+Open debut

By Rex Bowman
West Coast Correspondent

BURLINGAME, Calif. — During 3Com Corp.'s recent Network Systems Forum here, at which it announced the shipment of 3+Open LAN Manager, the company also introduced two network management tools for its 3+Open product line.

3+Open is 3Com's OS/2-based net operating system that supports nets of DOS, OS/2 and Apple Computer, Inc. Macintosh workstations.

Called 3+Open LAN View and 3+Open LAN Secure, the products are distributed applications that communicate via Named Pipes. Named Pipes is an interprocess communications mechanism that allows one program to communicate with another.

LAN View is an OS/2 Presentation Manager application that provides a network administrator with information on network performance, utilization, security and problems in graphical form. The data can be viewed in real time or from a historical file.

Data conversion capabilities in LAN View allow users to work with network management data in such applications as Lotus Development Corp.'s 1-2-3, Ashton-Tate Corp.'s dBase III and Microsoft Corp.'s Excel spreadsheet.

Network administrators can use LAN View's "click and zoom" feature to open windows on the terminal screen. By placing the cursor on a network node displayed on the screen and clicking the mouse, LAN View appears to zoom in like a camera, giving the viewer a larger, more detailed picture of the operations of the particular node.

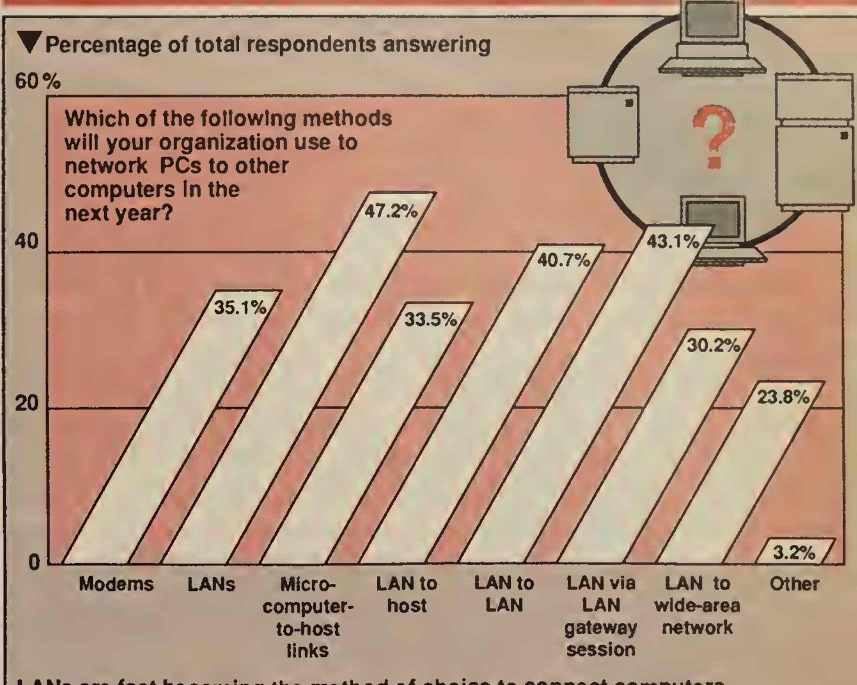
The LAN Secure application lets the net administrator design a password-control program that forces users to change their passwords after a given period of time. LAN Secure also tracks and logs access and use of network resources. This gives the administrator the ability to monitor such things as printer use and invalid logon attempts.

Both LAN View and LAN Secure reside on the 3+Open server. An OS/2 machine is required for presentation of the data.

Both products will be available in the first quarter of 1989. LAN View costs $495 per server, and LAN Secure costs $995 per net.

To reach 3Com, write to 3165 Kifer Road, Santa Clara, Calif. 95052, or call (408) 562-6400. ◼

Future PC networking preferences



LANs are fast becoming the method of choice to connect computers.

Figures are based on a survey of 337 *Network World* subscribers chosen et random. Percentages exceed 100% due to multiple answers. GRAPHIC BY SUSAN J. CHAMPENEY

CEO Noorda details Novell LAN strategy

Exec says company equal to the challenge of Microsoft/3Com's LAN Mgr., IBM's LAN Server.

In the 5½ years since Novell, Inc. began shipping its NetWare operating system, the Provo, Utah-based local-area network vendor has grown from 15 to 1,400 employees. During that period, NetWare has become the leader among network operating systems and, with an installed base of more than 2.2 million nodes, now accounts for more than 50% of the market.

In the second of a two-part interview with Network World *Senior Editor Laura DiDio, Novell President and Chief Executive Officer Ray Noorda discussed growth in the local network market and the challenge presented by the Microsoft Corp./3Com Corp. LAN Manager and IBM's LAN Server.*

Many industry analysts and some of your competitors forecast 35% growth in the local-area network industry over the next three years. Do you agree?

That's about right over the next three years, but I think growth will be higher over the next year.

The merging of segments of the information management business is continuing and that raises the question of exactly what constitutes the LAN industry. We can measure it in terms of PC networks, but that's only a part of desktop networking.

For example, Sun [Microsystems, Inc.] is clearly moving into the PC arena, and other PC players are moving upscale. No question about it, Apple will soon be in Sun's portion of the business.

Bill Lowe [president of the Entry Systems Division] at IBM has said that we'll soon see very low-cost PC workstations doing three-dimensional CAD/CAM. Products that sold for $100,000 five years ago are now down to $35,000 and will come down eventually to $5,000. The direction in the LAN industry is downscale in price and upscale in performance. And you can be sure that everyone will be in everyone else's business.

Some would argue that OS/2 LAN Manager constitutes the first serious threat to NetWare's status as market leader. What's your strategy for retaining your 50%-plus share of the market?

The real threat is IBM's upcoming LAN Server. We view that as a more serious threat than LAN Manager.

To retain our lead in the market, we have to stay two years ahead of the competition. We're doing that now. And that entails providing more functionality, more connectivity, more fault tolerance and more speed.

What type of functionality will you add to NetWare?

There are still about two or three levels of fault tolerance that we haven't addressed yet. System Fault Tolerant Level III hasn't been introduced yet. It will give users fault tolerance on a distributed basis. They'll have a migration path when their networks get big enough to require system fault tolerance and security for

(continued on page 28)

CEO Noorda details Novell LAN strategy

continued from page 27

transaction-based applications.

It's more a function of cost than anything. I think all users will realize they need fault tolerance once they figure out it doesn't cost them that much to have it. How much are they willing to spend to not have their networks go down and to not spend the time rebuilding? If it doesn't cost much, then they might as well buy it.

What other functionality can users expect to see in future versions of NetWare?

A lot more interconnectivity. We've only scratched the surface on that. We still have to provide greater connectivity to Apple. We have links to Apple, we have DEC VAX connectivity, and we basically have the first level of connectivity to the IBM 9370. We will offer connectivity to Sun sometime soon, as well as connectivity to various vendors' Unix-based systems. For example, NCR [Corp.] and Unisys [Corp.] will be tied in by next year.

At this point, IBM is positioning the LAN Server to work with OS/2 Extended Edition. Does that cause any problems for Novell?

We'll have similar problems to the ones we encountered with MS-Net and PC Net. They're not the same product. At the station levels, they're compatible, but that's where it ends. There are a lot of parallels between the near future — if indeed LAN Server is the near future — and the deep, dark past, which was two years ago.

We just don't know yet. We hear varying reports from both inside and outside IBM about the compatibility and whether they'll interface with LAN Manager, which IBM claims it won't. It really becomes a question of IBM and LAN Server [vs.] the Microsoft/LAN Manager world.

Also, based on the number of vendors who've said they'll support it, there's a potential for there to be several versions of the LAN Manager, just as there were several versions of MS-Net. It's a very uncertain world right now. It'll become more uncertain over the next six months when the products hit the market.

What steps can you take to ensure that Novell retains its market share and continues to grow in such an uncertain world?

(Laughing) Personally, I'm hiding in a cave. I don't want to see this frightening world. Seriously, we just want IBM and 3Com/Microsoft to get their products to market so we can see what they're all about.

We've also moved from a company that was heavily dependent on hardware to be primarily a software manufacturer. This way we can maintain our profit margins. For example, our network adapter cards will now be manufactured for us in the Far East in the next three or four months at a price that's about 60% of what it is now.

Will users witness a slugfest in the local-area network market in the next six months?

All I can say is that I'm conscious of the past and present and am anticipating the future with great eagerness. Novell likes what it knows: namely, that we have 2,000 vendors that support NetWare vs. 35 that have announced support for the LAN Manager.

But we don't know everything. We have to try not to get overconfident on the basis of a lot of the surveys we see. For instance, one survey shows that NetWare represents about 59% of the operating systems installed at Fortune 1,000 firms, and that figure will rise to 75% in 1989. But we don't know what will happen beyond next year until we actually see and can track the performance of the LAN Server and the LAN Manager. ◘

Netnotes

continued from page 27

device connects to a LattisNet concentrator through unshielded twisted-pair phone wire and provides a BNC connector to link to a thin-wire coaxial Ethernet network.

Previously, a LattisNet transceiver, an IEEE 802.3 repeater and a thin coaxial transceiver were all required to make the connection between the two disparate local networks, according to SynOptics spokeswoman Beverly Barnett. "The thin-wire adapter gives users a simpler and less expensive way to connect their Ethernets running on telephone wire with thin coaxial-cable Ethernets," she noted.

The maximum allowable distance for the unshielded twisted-pair cable connection between the concentrator and the adapter is 360 feet. It can connect to any thin coaxial segment that complies with the IEEE's 10Base2 specifications.

The Model 2600 Thin Net Adapter is priced at $725 in single-unit quantities.

SynOptics also recently introduced a work group concentrator that links up to eight workstations connected to each other over unshielded twisted-pair wire to a coaxial cable backbone.

The 2530 Attachment Unit Interface/Unshielded Twisted Pair (AUI/UTP) Workgroup Concentrator supports Ethernet speeds of 10M bit/sec and doubles as a signal repeater that strengthens and regenerates Ethernet data signals, eliminating the need to attach a multiport repeater to the concentrator.

The concentrator also provides retiming for signals it transmits over the unshielded twisted-pair wire.

Ethernet coaxial cable connects to the concentrator via an IEEE 802.3 standard AUI connector. The concentrator's eight unshielded twisted-pair ports use standard RJ-45 jacks.

The 2530 AUI/UTP Workgroup Concentrator is priced at $2,995 and is available now.

SynOptics is located at 329 N. Bernardo Ave., Mountain View, Calif. 94043, or call (415) 960-1100. ◘

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2. Mail Entry Form to: Communication Networks, "See The Communications World" Contest, P.O. Box 9171, Framingham, MA 01701-9171. Be sure to affix postage.
3. All entries must be received by midnight, November 15, 1988. Contest drawing will be held November 30, 1988. Communication Networks is not responsible for entries delayed, late, mutilated or lost in the mail. Odds of winning depend on the number of entries received. ***Only one entry per person.*** Entries become the property of Communication Networks.
4. One (1) First Prize, one (1) Second Prize and one (1) Third Prize will be awarded. Winners will be selected at random. All prizes will be awarded, and winners will be notified by phone. Only one prize per individual. Prizes are non-transferable and no substitutions or cash equivalents will be allowed. Winners will be required to provide consent for use of their name and picture in advertising and publicity.
5. The contest is open to residents of the continental U.S. and Canada, 18 years of age and older, except employees of International Data Group, its agents, affiliates and subsidiaries. This offer is void where prohibited, and subject to all federal, state and local laws.
6. Contest is sponsored by Communication Networks, which is produced by IDG Conference Management Group, an International Data Group Company. For a list of winners, enclose a stamped, self-addressed envelope with your Entry Form.

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Yes, please enter me in your "See The Communications World" Contest and send me all the details about CN '89. I understand that I do not have to register for CN to be entered in the contest.

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Communication Networks
"See The Communications World" Contest
P.O. Box 9171
Framingham, MA 01701-9171

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

"The reality is that cable cuts will happen, and we need to be prepared. With thousands of cowboys in backhoes digging along our highways — most of them without permission from anyone — there's no way we can avoid it."

Frank Blount
President
Network Operations Group
AT&T
Basking Ridge, N.J.

Dialogue

What will be the most significant changes in communications management over the next 10 years?

"Managers will have to recognize the importance of timely information to keep up with the rapid changes occurring in the communications industry. New products and new vendors appear almost on a weekly or monthly basis. It reminds me of the computer industry 10 years ago.

"Maybe someday we'll need a *Network World* daily."

James Modena
Manager of
telecommunications
Waste Management
Group, Inc.
Crompond, N.Y.

"Communications managers have to take much more of a business approach. They need to perceive strategic business applications of emerging technologies. Then they have to be able to sell these applications to top management, which means they have to know the right people to talk to and how to speak their language. MIS had to make this transition; now it's our turn."

James Bruggeman
Telecommunications
network manager
The Dun & Bradstreet Corp.
Murray Hill, N.J.

"Communications managers will play an important role in

(continued on page 31)

WATTC to set rules for int'l telecom

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — Users, policymakers and standards groups are involved in a major effort to draft regulations for international communications. This effort will be the focus of an upcoming global forum on telecommunications.

The World Administrative Telegraph and Telephone Conference (WATTC) will convene in Melbourne, Australia, Nov. 28 through Dec. 9 to develop a regulatory framework governing the provision and use of international telecommunications services.

The WATTC is a special meeting held by members of the Consultative Committee on International Telephony and Telegraphy to examine regulation of private-line and enhanced services internationally. The CCITT and the Consultative Committee on International Radio make up the International Telecommunications Union, which has 169 member companies.

A set of preliminary regulations, drawn up during several meetings of a preparatory committee, addresses what types of international communications services are to be regulated, who will be able to provide services and under what conditions users can purchase them.

The new regulations, which are spelled out in 10 articles, would replace the set of rules set forth by the WATTC in 1973.

One difficulty WATTC representatives face is defining the services to be regulated. Basic telecommunications services, which are covered by the current WATTC agreement, will also be covered in the new WATTC pact.

Regulations covering private-line, enhanced or value-added services not currently regulated by the WATTC may be the most valuable but also the most controversial aspect of the new agreement, according to speakers at a recent seminar here on the WATTC sponsored by the Annenberg Washington Program on Communications Policy Studies.

"Since the previous regulations were written, people have worked out arrangements [for basic telecommunications services] that work in the real world," said Kenneth Englehart, general counsel for the Canadian Business Telecommunications Alliance. However, countries have had difficulty working out agreements for enhanced information services and leased-line services used to build private networks, according to Englehart.

The proposed WATTC agree-

(continued on page 30)

GUIDELINES

BY ERIC SCHMALL

An idea is born: how to foster creativity

Only through creative applications of communications technology will many organizations survive the next decade, industry pundits often say.

Though overused, this maxim is true. Unfortunately, many communications departments still embrace management processes that not only impede creativity but root it out before it can bloom. The environment in many communications groups allows problems to exist that could easily have been solved with just a little innovation.

Much of the blame for this situation lies squarely with communications managers. No managers will admit to being against creative thought, but most give mere lip service to the concept.

Communications managers who accept creativity take a conscious risk. Creativity thrives in environments where leaders relinquish power. To let employees feel brave enough to suggest plans, managers must listen to, and at times accept, ideas diametrically opposed to their own.

Likewise, managers must balance freedom with constant feedback. They should encourage employees to innovate, but they should also make it clear that they want results. This requires an attitude that many managers are unprepared to adopt. For many managers, the personal sacrifices required to accept new ideas are greater than their egos will allow.

(continued on page 31)

Schmall is network systems manager for an insurance holding company.

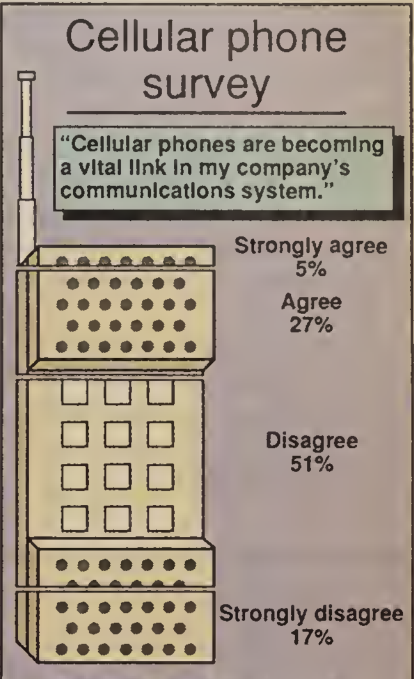
Cellular phone use up, vital for many

Mobile telephones are becoming an essential ingredient of many firms' communications.

By Wayne Eckerson
Staff Writer

Although cellular telephones have been on the market for only about five years, they already play a critical communications role for some users, and others are discovering ways the technology can augment existing communications tools.

Despite the relatively recent emergence of mobile telephones, in a survey commissioned by *The Wall Street Journal*, 31% of the 630 communications managers interviewed said cellular phones are becoming a vital part of their company's communications. The survey was conducted by the market research firm Erdos and Morgan, Inc. during February and March.



Figures are based on a survey of 600 International Communications Association members conducted by the *Wall Street Journal.*
GRAPHIC BY SUSAN J. CHAMPENEY

Most cellular phones are used by senior executives who want to make better use of their commuting time or by sales representatives who spend most of their working day on the road, said Blair Pleasant, an analyst at The Yankee Group, a Boston consulting firm.

Currently, there are 1,200,000 cellular phone subscribers nationwide, and analysts predict that this number will nearly double by 1990 (see chart on this page).

> "Cellular phones pay for themselves very quickly. Time is money for senior executives," SmithKlein and French's McKeown said.

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"Cellular phones pay for themselves very quickly. Time is money for senior executives, and cellular phones help them make more efficient use of their driving time," said Frank McKeown, administrator of private branch exchange and voice communications at SmithKlein and French Laboratories, a major pharmaceutical company in Philadelphia.

Ian McGibbon, manager of communications architecture at the Bank of Montreal, said executives at his bank use mobile phones to check the prices of treasury bonds on their way to work each morning, and account managers use the phones to get updated information on the accounts of clients they are driving to meet.

S.J. Loferski, a telecommunications consultant for GPU Service Corp., which operates the Three Mile Island nuclear power plant, said that during the 1979 crisis at the plant, the company's chairman used a cellular phone to keep in touch with officials in neighboring states who needed up-to-the-minute information about the situation.

Damage claims representatives at Geico Corp., an insurance company based in Chevy Chase, Md., use cellular phones for both voice and data transmissions in the field, according to Jess Reed, assistant vice-president of telecommunications.

The claims representatives use the cellular phones to call their home office to find out their schedule of appointments for the day or to ask questions about an estimate. Using portable computers housed in a briefcase with a printer and modem, representatives can also prepare on-the-spot damage estimates by accessing data bases on Geico host processors.

Reed said cellular phones have worked well in transmitting voice conversations but are less reliable for data transmission. He said that only about 60% to 70% of data calls go through without a problem. Reed said representatives are required to park at the highest elevation in the area when they transmit data with their cellular phones.

(continued on page 30)

Cellular phone use up, vital for many

continued from page 29

Currently, AT&T Bell Laboratories is developing a method for supporting digital transmission for cellular phones, which will improve the reliability of data transfers across cellular links, according to Pleasant.

Digital cellular transmissions will improve transmission quality for both voice and data, and quadruple the call-handling capacity of transmission facilities, according to Pleasant. The service will increase the number of subscribers that operators in each geographic region can support, she said.

Bell Laboratories will test the service next summer, Pleasant said.

Despite the flexibility offered by cellular telephones, communications managers interviewed by *Network World* said few companies have yet explored applications of the technology beyond keeping in touch from the road.

"The use of cellular phones is currently nowhere near its potential. Businesses have yet to realize the benefits and applications available through cellular technology," Loferski said.

> "The use of cellular phones is currently nowhere near its potential," GPU Service's Loferski said.

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"Businesses won't go out and buy cellular phones because they don't see applications," he said. "I bet if they sat down and thought about it, they would discover a number of applications. The vendors should be faulted for not publicizing other applications for cellular phones. Currently, few people think of cellular phones being used outside an automobile."

Prohibitive cost

There are other reasons why many businesses have chosen not to invest in cellular phones. For one, many companies still find the costs of purchasing and using cellular phones prohibitive.

The cost of a car phone ranges from $500 to $1,000, and briefcase and handheld portable cellular phones cost upwards of $1,800. From there, cellular phone subscribers pay a fixed monthly fee and are charged about 30 cents a minute for calls they make and receive.

On average, cellular phones cost users $120 a month, according to Victor Krueger, an analyst at Dataquest, Inc., a market research firm in San Jose, Calif. Krueger said that while the price of the phones has dropped tremendously since they first appeared on the market, the overall cost, especially the monthly service charge, has made many businesses reluctant to invest in the technology.

Some users have complained that urban areas are oversubscribed and that vendors are not installing enough new cells to provide extra capacity. The result is a large number of busy signals and dropped phone calls that reduce the reliability of the service, McGibbon said.

Urban areas also are subject to "shadowing," or the blocking of transmissions by tall buildings.

While *The Wall Street Journal* survey indicated that one-third of communications managers thought cellular phones are vital for company communications, fully two-thirds did not. For some in that number, cellular phones play an important supporting role but not a vital one.

"Cellular phones are not vital to our communications strategy but they are a part of it," McGibbon said. "They are integrated within our overall network program and are kept around for backup communications in case our telecommunications system crashes."

Geico's Reed said cellular telephones rate about an eight on a one-to-10 ranking scale, with 10 being the most important.

"The phones are not as important as other communications equipment our company uses, but they still play a significant role in how we operate," he said. ◘

WATTC to set rules for int'l telecom

continued from page 29

ment calls for both basic and enhanced services to come under a common regulatory umbrella. The agreement states that international regulations should apply to "any entity" using the international telecommunications network to provide services.

Although this might establish a uniform set of rules for telecommunications services, many have expressed concern that it would subject private network users to the same regulations as carriers.

Englehart said that if the regulations "restrict enhanced services and leased networks, we'll wish we had stuck with the old [regulations]. It wouldn't make sense for a user with his own leased network to be considered a carrier."

Peter Allen, managing director of international regulatory affairs for American Express Co.-Europe, also expressed concern about the application of international regulations to corporate network users. International regulations could limit the ability of private networks to take advantage of new technologies, Allen said. Allen is a representative of the International Telecommunications Users Group.

Federal Communicatons Commission Chairman Dennis Patrick told attendees at the Annenberg program that the U.S. opposes language in the WATTC document calling for regulation of international private-line and enhanced telecommunications services.

Such regulations would be needlessly intrusive for companies that use the network to provide nontelecommunications services, such as banks, airline reservation

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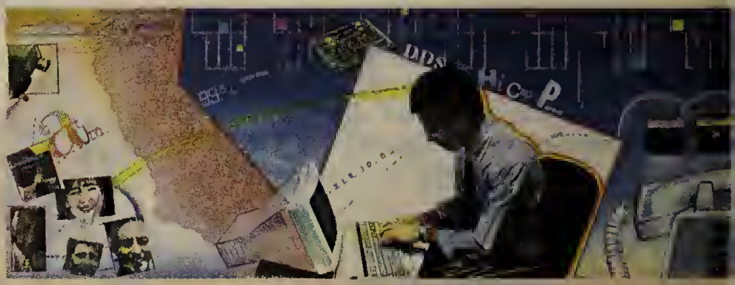

Our Public Packet Switching Network links Wells Fargo to more than 3,000 cash registers and terminals, allowing retailers to authorize and post card transactions quickly and reliably.

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systems and data base services, he said.

Applying regulations to advanced communications services widely used by large businesses could slow the development and introduction of the new technologies, possibly compromising the future of the industry, Patrick said.

Allen said he is also troubled by language in the WATTC regulations that would require mandatory adherence to network standards drafted by the CCITT. Users and carriers now voluntarily utilize CCITT recommendations in their networks, but they also use other standards, he said.

Patrick agreed that adherence to CCITT recommendations should remain voluntary, especially in light of the rapid changes occurring in the industry.

Although a number of countries, including the U.S., advocate limited regulation for international enhanced and private services, this position is far from universal. Countries with government-controlled telecommunications entities are less willing to move quickly with the introduction of new services and are more open to regulation. This is often believed to slow the industry, according to Albert Halprin, former chief of the FCC's Common Carrier Bureau and currently with the Washington, D.C. law firm of Dewey, Ballantine, Bushby, Palmer and Wood.

Even though countries differ on basic points of policy, many of the speakers at the Annenberg program insisted that there is a good deal of agreement internationally on telecommunications regulation. Englehart said the meeting will primarily be used for hammering out language that accurately reflects the mutual positions of WATTC members. ◘

An idea is born: how to foster creativity

continued from page 29

The support or suppression of creativity begins in the hiring process. The creative personality, by definition, challenges the status quo and questions "safe" ways of doing things. Only a mature manager will hire and tolerate this type of person.

A manager has to allow questions to be asked and old assumptions to be reevaluated. Creative people have to be given access to untried technologies or "forbidden" vendors.

This can be risky business for a manager who is accustomed to a staff that supports the existing communications structure, products and methodologies.

Assuming the best of both worlds — that a manager has fostered an atmosphere of creativity and hired a platoon of innovative workers — the greatest challenge still remains. Managers have to be the chief advocates of new ideas. Otherwise, these ideas will wither and fade before getting the chance to improve a department's performance.

New concepts are never as vulnerable as when they are in the development stage. Innovative ideas must survive the dangerous passage through the decision-making chain before they enter a hostile world opposed to change.

Once convinced of an idea's merit, a communications manager must translate it from technobabble to business advantage so that nontechnical senior managers will support the plan.

Despite the relative youth of most communications departments, many are bogged down by old assumptions and technologies. This problem can be compounded by a culture that repels creative problem-solving.

By fostering creativity, communications managers can avoid that stifling environment. ◘

Dialogue

continued from page 29

developing new products and services that are technology-dependent. Managers will need to encourage their staffs to take a more assertive role within the company, instead of serving as support staff.

"Also, managers will have to be able to design a flexible network architecture that meets the needs of their company today and in the future. That's difficult because it isn't easy to determine which vendors sell products that meet your needs and which vendors will be around in the future."

John Morrison
Vice-president of voice
and facilities planning
Sears Communications
Network, Inc.
Arlington Heights, Ill.

“More telecommunications managers will have business degrees because they will need to play a more important role in day-to-day business decisions.

"Also, managers are being overwhelmed by the number of suppliers and new products on the market. It is impossible to stay up-to-date. Managers will need to limit themselves to several full-range suppliers that they know can meet their needs reliably. Companies like AT&T and Northern Telecom will take dominant roles again."

Stephen Mayo
Manager of
telecommunications
University of Michigan
Ann Arbor

“Managers will need to stay in tune with their companies' organizational and operational needs. Companies are requiring ever-larger networks. As this happens, managers need to focus on cost-control and cost-avoidance issues. They will have to be concerned with how to deliver the service as well as what products and services they supply. Finally, they will have to devote resources to professional development.

"Communications is a volatile industry with high turnover. Managers must take care to build expertise beyond the first- or second-line managers."

Garry Herzman
Director of
telecommunications
University of Chicago

rides with us.

Pacific Bell, California's voice communications leader, is also at the forefront of data transmission. We have a data service for virtually any application and budget. And our support network is unmatched.

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"Yesterday, somebody asked me what I think about LattisNet. Here's what I told him in a nutshell."

W.C. Wise, Ph.D.
Assistant to the Vice President for Academic Information Management, Medical University of South Carolina

If you're running Ethernet without LattisNet, you're doing it the hard way.

LattisNet means not having to rewire your premises with coaxial cable. SynOptics created the idea and perfected the technology two years ago. SynOptics was the first to put Ethernet on telephone wire, the IBM Cabling System and fiber optic cable. And now, first to put the UTP transceiver on a chip for network adapter cards. Today over half of the Fortune 500 have LattisNet. Here's why.

LattisNet is the networking *utility* that enables you to run Ethernet in a star topology over your existing building wiring. No matter who your computer vendors are. Or how many buildings you have.

Full-speed, no-compromise, IEEE 802.3-standard Ethernet. At 10 Mb/s.

Are You Running Ethernet, or Is It Running You?

Just imagine what you could save in time and money by installing Ethernet without having to run coaxial cable throughout your building.

Then consider this. LattisNet is also more reliable and easier to maintain than traditional Ethernet.

It's hard to believe that you could manage a network without an integrated fault isolation and diagnostic capability. With LattisNet, it's standard equipment. With traditional Ethernet, it's not even an option.

A concentrator for every size of workgroup, department and premises application gives you a full range of flexibility.

And, unlike traditional Ethernet, LattisNet is extremely simple to configure, reconfigure and expand.

It was designed that way, based on modular concentrators that reside in your wiring closets using the most common cabling connectors.

It means that moves and changes can be completed in minutes while the network stays up. That keeps end users happy.

Then, when there's a need to expand the size of a network, you upgrade the system simply by adding a module or concentrator.

That makes everybody happy.

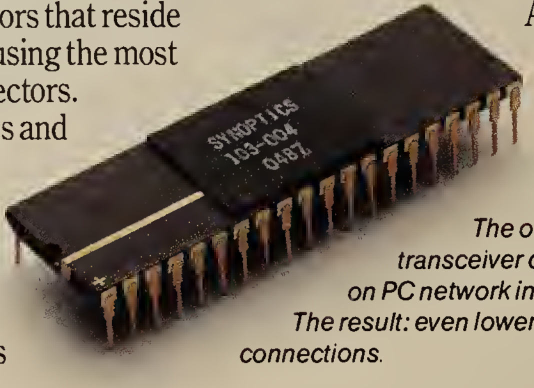
All In The Family.

SynOptics Communications makes concentrators in three sizes to economically accommodate network growth, from very small to very large.

The new Workgroup Concentrator accommodates as few as two to eight users—either in stand-alone workgroups or as subnetworks within big networks.

For even larger applications, each Department Concentrator handles up to 24 users. And each Premises Concentrator handles up to 64 users, with no end to the number or mix of concentrators. And LattisNet has all major worldwide safety approvals.

The idea is big and simple at the same time. That's why more than 250 of the Fortune 500 companies are running LattisNet now. There are more than 75,000 Ethernet nodes in over 500 LattisNet local area networks across the United States and Europe. It works. And there's no better way.



The on-board transceiver chip is integrated on PC network interface cards. The result: even lower cost connections.

LattisNet runs on the cable that's already installed in your building.

Kinetics, Micom-Interlan, Novell and Western Digital Can't All Be Wrong.

That's right. The leading board manufacturers have put LattisNet transceiver chips on their cards for Macintosh, IBM, COMPAQ and other compatible PCs, workstations and file servers. And of course, it's not only simpler and more convenient than an external transceiver—it's substantially less expensive.

Simply put, there's no better way to run Ethernet.

Call (800) USA-8023 for the LattisNet connectivity guide or to talk to a technical representative.

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"SIMPLY PUT, THERE'S NO BETTER WAY TO RUN ETHERNET."

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

Next week: *Network World*'s Industry Focus on manufacturing looks at the direction being taken by MAP/TOP supporters and the efforts of Du Pont to achieve productivity gains through electronic data interchange.

First Look

PC net-to-facsimile gateway board out

GammaLink, Inc. recently introduced a facsimile modem board that enables local-area network-attached IBM Personal Computers to send and receive CCITT Group III facsimile messages.

The **GammaFax Communications Professional (CP)** board resides in a network file server or a single Personal Computer configured to act as a facsimile gateway for other local-area network-attached Personal Computers.

Personal Computers outfitted with software developed by Brightworks, Inc. and CompFax Software International, Inc. can access the GammaFax CP boards via a local network. Brightworks' NETRemote enables Novell, Inc. NetWare-based personal computers to access the GammaFax CP board residing in a gateway, while CompFax's Faxway enables 3Com Corp.'s 3+ Mail users to send 3+ Mail messages via facsimile.

Eight GammaFax CP boards can be installed in a Personal Computer-to-facsimile gateway.

GammaFax CP works with GammaFax Version 4.1 software running on the host IBM Personal Computer.

GammaFax CP will be available to end users later this month at a price of $1,095.

GammaLink, Inc., 2452 Embarcadero Way, Palo Alto, Calif. 94303, or call (415) 856-7421.

CDC offers new version of NOS/VE

By Jim Brown
New Products Editor

MINNEAPOLIS — Control Data Corp. recently announced a new release of its Cyber mainframe NOS/VE operating system that supports a CCITT X.400-compatible electronic mail application and links to Unix-based systems.

Release 1.4.1 of NOS/VE adds support for Unix through adoption of Sun Microsystems, Inc.'s Network File System (NFS). NFS enables Unix-based systems and Cyber mainframes attached to the same Ethernet to communicate on a peer-to-peer basis. Previously, Unix-based systems could access Ethernet-attached CDC mainframes only by using Transmission Control Protocol/Internet Protocol software. NFS supports a wider range of functions than TCP/IP.

The new NOS/VE release will also support CDC's Archive/VE, which automatically performs the data format conversion that lets Unix systems store and retrieve files from Cyber-attached storage devices without running separate conversion software.

CDC's enhanced Mail/VE application enables Cyber-attached terminals to create E-mail messages in X.400 format and exchange them over a TCP/IP network with other Cyber-attached terminals and Unix systems. Interfaces linking Mail/VE to other X.400-compatible systems will be released next year.

The company also enhanced its Loosely Coupled Network (LCN) for its mainframes and enhanced its CDCNET local network software.

The enhanced LCN, a 50M bit/sec network that connects CDC Cyber mainframes, CDC ETA10 supercomputers, Cray Research, Inc. supercomputers, Digital Equipment Corp. VAXes and IBM mainframes, now supports IBM mainframes running VM/SP. Previously, LCN supported only VM/MVS-based IBM mainframes.

CDCNET, a local network operating system running on CDC mainframes and engineering workstations, was also enhanced to enable IBM 3270-type terminals to access a Cyber mainframe.

The enhanced CDCNET, which supports connections between CDC devices at 10M bit/sec, enables a Cyber mainframe to be tied to an IBM front-end processor using an IBM Synchronous

(continued on page 57)

Ethernet repeater hub links various cable types

ROCHELLE PARK, N.J. — Lannet Data Communications Ltd., a subsidiary of Rad Data Communications Ltd. recently announced an Ethernet repeater hub that can connect Ethernets based on thick and thin coaxial cable and support stand-alone nodes with fiber-optic or twisted-pair links.

The Multinet hub can be used to link multiple work group networks or individual Ethernet nodes in a single logical network consisting of up to 1,024 devices.

The Multinet chassis has 16 slots that can be used to support interfaces for thin and thick coaxial-cable Ethernet segments or fiber-optic and twisted-pair interfaces for stand-alone devices.

The Multinet fiber interface for independent nodes has two ports and supports devices outfitted with Lannet's fiber-optic transceivers. Likewise, a four-port twisted-pair chassis module supports four Ethernet devices using Lannet's twisted-pair wire transceivers.

The thin coaxial-cable interface module has two ports, enabling users to connect two thin coaxial-cable Ethernet segments to a Multinet chassis. Each of those segments can support up to 30 devices and be up to 600-ft. long. The thick coaxial-cable transceiver module supports connection of a 1,650-ft.-long thick coaxial-cable Ethernet segment consisting of about 200 devices.

A port on the dual fiber-optic module or the twisted-pair module can be used to link Multinet chassis, thus enabling users to build a single backbone Ethernet.

Up to 17 Multinet chassis can be supported on twisted-pair wire, while 22 can be supported via fiber-optic cable.

Communications between Multinet hubs is synchronous, as opposed to the asynchronous transmission supported by traditional Ethernets. A spokesman for the company said traditional Ethernets support data packets that are transmitted asynchronously.

The Multinet active star chassis costs $2,000. The Multinet chassis-resident modules range in price from $612 each to $1,250 each, and the transceivers range in price from $285 each to $820 each.

Lannet can be reached by writing to 151 W. Passaic St., Rochelle Park, N.J. 07662, or by calling (201) 587-8822.

Retix shifts course, goes after end users

X.400 electronic mail system marketing effort signals switch from vendor-only sales strategy.

By Jim Brown
New Products Editor

SANTA MONICA, Calif. — After years of selling its interconnect software to other vendors, Retix last week announced that it will market a local network-based X.400 electronic mail system to end users.

The system includes the company's RetixMail and OpenServer 400 software, enabling local network-attached IBM Personal Computers to exchange electronic messages with remote X.400-compatible systems, including mainframes and minicomputers. Like other E-mail systems, it also enables microcomputers on the network to exchange X.400-compatible E-mail messages and files.

RetixMail runs on end-user Personal Computers with at least 640K bytes of random-access memory, while OpenServer 400 runs on a Personal Computer configured as a file server.

Messages sent to OpenServer 400 using RetixMail are forwarded to other local RetixMail users or to remote X.400 users via an X.25 network.

Until now, Retix has sold its Open Systems Interconnection-based software to vendors that used it to develop end-user products. But according to Andy De Mari, Retix chairman and chief executive officer, vendor orders for OSI-based development tools have slowed.

Retix developed RetixMail as a new product, and it used its existing OSI software to develop OpenServer 400, De Mari said. The company said it will not compete against vendors that used Retix software to develop products because those products support gateways linking proprietary E-mail packages and X.400.

Instead, RetixMail, running as a Microsoft Corp. Microsoft Windows application, creates messages in X.400 format. It also enables users to include Personal Computer files as part of an X.400 message.

OpenServer 400 includes Message Transfer Agent (MTA) software and a Wide-Area Network Coprocessor board that handles the link-layer OSI protocols. The board is installed in the same Personal Computer running MTA.

MTA takes messages from the local net and routes them to local users or to an X.25 wide-area net. If a remote recipient is not a RetixMail user, the message can be automatically forwarded via X.25 to a public E-mail service, minicomputer or mainframe that will convert X.400 messages to a proprietary E-mail system.

MTA software is compatible with network operating systems running under DOS 3.1 or higher, such as IBM's PC Network Program, Novell, Inc.'s NetWare, 3Com Corp.'s 3+ and Microsoft Networks.

Retix sells three Wide-Area Network Coprocessor boards: One has an RS-232 port supporting speeds up to 19.2K bit/sec; the second has an RS-232 or V.35 interface supporting speeds up to 64K bit/sec; and the last can be outfitted with an RS-449, RS-530 or X.24 interface supporting speeds up to 64K bit/sec.

OpenServer 400 includes an administrator software module that can be accessed by designated RetixMail users.

> RetixMail runs on end-user Personal Computers with at least 640K bytes of RAM.

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The package also includes an application program interface (API) that third parties and end users can use to develop links between existing Personal Computer applications and OpenServer 400.

That API will enable Retix to sell its OpenServer 400 to vendors that want to interface proprietary E-mail, electronic data interchange and Personal Computer-to-facsimile conversion packages to OpenServer 400.

Retix also said it is developing a Unix- and OS/2-based version of RetixMail and OpenServer 400 that will be available in 1989. Other enhancements in the works, De Mari said, will enable OpenServer 400 to support OSI applications such as File Transfer, Access and Management as well as virtual terminal emulation, X.500 directory services and network management.

The cost for an OpenServer 400 supporting one wide-area network link and 100 copies of RetixMail is $7,000.

Retix can be reached by writing to 2644 30th St., Santa Monica, Calif. 90405, or by calling (213) 399-2200.

OPINIONS

USER-VENDOR RELATIONSHIPS

BY EFREM MALLACH

Ignorance is no excuse for consultant abuse

Any story with two sides usually has a third ("Ignorance is no excuse for incompetent sales support," *NW,* May 9; "Ignorance is no excuse for vendor abuse," *NW,* Aug. 15). The third side in many sales situations is the consultant's view.

Vendors must treat consultants, not just users, properly if they want the best sales results possible.

Users call in consultants for vendor selection assistance when one or more of the following conditions exists: The user doesn't purchase the product or service in question very often; the technology of the product or service is sufficiently complex that the user doesn't understand it and doesn't mind admitting this; or the potential damage from making the wrong choice is significant.

> Vendors must treat consultants properly if they want the best sales results possible.
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It's no wonder that users choosing networks or other complex computer or communications products and services frequently engage consultants. Debra Rabin, consultant relations head at Mitel, Inc. in Boca Raton, Fla., reports that users engage consultants 60% of the time when they are purchasing private branch exchanges from 100 to 500 lines and 76% of the time when they are buying PBXs with more than 500 lines. Vendors ignore this buying influence at their peril.

Good consultants benefit all concerned. They shorten the educational process that vendors provide for users. They tell a vendor quickly when a product is unsuited for an application, thus reducing wasted time. They understand the benefits and dangers of the newest technologies and translate this understanding into nontechnical terms for users. They help users make objective decisions rather than be swayed by glossy brochures or a vendor's reputation.

Selling into a user-consultant environment is not the same as selling into a user-only environment. Far too many vendor salespeople work cooperatively with users but see consultants as interlopers who interfere with their account control or otherwise reduce the effectiveness of their sales techniques. This attitude destroys one side of the three-way relationship.

What these salespeople forget is that users engage consultants. They trust consultants and will listen to what they say. How much better, then, to develop a cooperative relationship with the consultant too — and work as a team to satisfy the user's requirements.

Most communications firms understand this, at least at headquarters. Most have a formal consultant liaison group that keeps in touch with consultants via seminars, advertisements, newsletters and other mailings. It provides information via consultants' reference manuals, other documentation and over the telephone. It may send a representative to meetings with heavy consultant attendance, such as those held by the Society of Telecommunications Consultants. In short, it does what it can to hold up the vendor side of the consultant relationship.

But it takes more than a central group, however well-intentioned, to do the whole job. An attitude of partnership with consultants must pervade the entire organization. Vendors must see consultants not only as an extension of user organizations but as an extension of the vendor's sales force, with some characteristics of both — sometimes including, unfortunately, insecurity and arrogance. Vendors who manage their consultant relationships properly will find their sales forces more effective — and their users more satisfied.

Mallach is associate professor of management at the University of Lowell in Lowell, Mass., and a marketing consultant to computer and communications vendors.

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EDITORIAL

Revolt against token bus may alter MAP's course

Ungermann-Bass, Inc.'s decision to base its future Manufacturing Automation Protocol products on token ring and Ethernet, rather than the token-bus technology MAP calls for, is stirring controversy among users and their suppliers.

Ungermann-Bass' decision raises an interesting question: Will vendors that opt to go their separate ways for certain aspects of the MAP standard undermine the entire MAP effort, which is intended to limit options and thereby deliver network compatibility for multivendor systems?

Both sides of the argument have their merits.

Hard-core MAP proponents say the standard is meant to be just that, a fixed set of rules by which everyone must play. Deviation from the norm, they say, may be the crack in the dam that dooms the whole effort, leaving a collection of vendors halfheartedly devoted to a bastardized standard in an environment that doesn't offer much more than the proprietary networks prevalent today.

Ungermann-Bass and others that argue for more flexibility in MAP say users drive the market through their wallets. They say vendors can't pour research and development dollars into a subset of a standard when many of their customers are asking for other options. Ungermann-Bass says its efforts to sell broadband token-bus networks have proved unprofitable.

Digital Equipment Corp. President Ken Olsen also has spoken out against the token-bus requirement, saying Ethernet is just as viable for factory networks. Olsen claims DEC can't afford to pour millions into MAP because it is already committed to Ethernet.

The problem, it seems, is that few users have the resources of General Motors Corp., and many are sacrificing the long-term vision of MAP for short-term savings.

MAP purists argue that the cost of 802.4 technology will decrease as the technology is accepted. Moreover, they say, evaluating MAP on the basis of the cost of interface products doesn't take into account other network costs.

According to Tony Friscia, president of Advanced Manufacturing Research, Inc., a research and consulting firm in Cambridge, Mass., 802.4 token-bus interface cards for personal computers and other shop floor devices can cost more than $1,000, while interfaces for more common local nets may cost only $300 to $400.

Further, Friscia says, 50% to 60% of the factory networks installed to date are based on Ethernet or the IEEE 802.3 standard for Ethernet. Only 5% are IEEE 802.4 token-bus networks.

It's hard to justify throwing out Ethernet to replace it with a token bus that costs more per connection.

GM, for example, claims the total cost of connecting a node to a MAP network — including requisite software and other hardware — has dropped from $8,000 to less than $3,000. That compares with $3,500 for proprietary networks, according to GM.

> The problem, it seems, is that few users have the resources of General Motors Corp., and many are sacrificing the long-term vision of MAP for short-term savings.
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Regardless of cost, and with or without the blessings of vendors like Ungermann-Bass and DEC, users ultimately will decide if token ring and Ethernet are adequate substitutes for token-bus factory networks.

As Friscia says, "It's a market-driven issue, not a religious issue."

Only time will tell if the MAP/TOP Users Group opts for flexibility or is forced into it by the buying habits of other corporate users.

OSI STANDARDS

BY JEROME ELKIND

Taking a giant step in the right direction

In June, major information system users and vendors gathered at the Enterprise Networking Event '88 International (ENE '88) in Baltimore to demonstrate the viability of Open Systems Interconnection as a multivendor interconnection standard. Yet even with industry leaders such as General Motors Corp., IBM, AT&T, Boeing Computer Services Co., Xerox Corp., Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. participating, the response of many attendees — including corporate managers, consultants and the trade press — was skeptical.

While everyone agreed that serious progress has been made in implementing OSI, there were frequent complaints, such as "When will we stop seeing demonstrations and start getting working products — and lots of them?"

The introduction of a new systems architecture is difficult. It doesn't happen overnight, and the new architecture doesn't cause the immediate demise of existing established architectures. Consequently, the use of OSI will increase gradually.

OSI will ultimately succeed as a standard because it has no serious competition.

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The greatest near-term use of OSI will be as the preferred vehicle for the interconnection of existing proprietary architectures through gateways or equivalents. The CCITT X.400-based message-handling systems demonstrated so effectively at ENE '88 were the first large-scale applications of OSI for this kind of interconnection.

The use of OSI as a complete replacement for established architectures will proceed more slowly. Elements of the OSI architecture are already being used widely in products. Ethernet local-area networks based on the 802.3 standard are an example. OSI network and transport protocols are now emerging as the next layers to move toward wide-scale product application.

There will be enormous benefits to both users and vendors from the adoption of these standards, and this will be an important step in realizing the full promise and potential of OSI.

There have been strong indications from the Manufacturing Automation Protocol and Technical and Office Protocol communities of users and vendors that great progress is being made in the adoption of OSI as the foundation of manufacturing and office system applications. ENE '88 made it clear that OSI will be a major force in the industry. It is no longer a question of whether or not, but of when and how much.

Users, not vendors, are the driving force behind OSI as the communications environment of choice.

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Given the rewards that OSI provides in multivendor connectivity and application integration, even a five-year wait in the full use of OSI is actually not that unreasonable. By then, the Corporation for Open Systems will have finished much of its work on ensuring OSI product interoperability and testing, making OSI a fully operational standard — one that provides widespread connectivity in communications and in document interchange and printing.

The major impetus for OSI is coming not from vendors but from users. They are the chief driving force behind OSI as the communications environment of choice. Users are demanding international standards that link products not only from different vendors but across national boundaries as well. International data exchange is already needed for an increasingly global marketplace, in which a tremor on Wall Street causes aftershocks in Tokyo and London.

As more organizations around the world need to communicate with one another, international communications and document standards become critically important.

OSI will ultimately succeed as a standard because it has no serious competition. Transmission Control Protocol/Internet Protocol, the only other truly vendor-independent standard, simply cannot handle the required range of applications.

And today's proprietary network technologies — however application-rich they may be — lack the aura of universal compatibility. To survive into the 21st century, these proprietary networks will need to have not only gateways to OSI networks for such interdomain applications as electronic mail (X.400) and File Transfer, Access and Management, but also native OSI protocol implementations to ensure access to the full range of OSI products and applications.

However, it is unreasonable to expect that vendor-specific networking protocols such as Systems Network Architecture and Xerox Network Systems will suddenly disappear. Many vendor-proprietary systems offer significant advantages over current OSI protocols in terms of completeness, performance and functionality. Further, to ensure compatibility with existing products and services will require that these proprietary protocols be supported well past the year 2000.

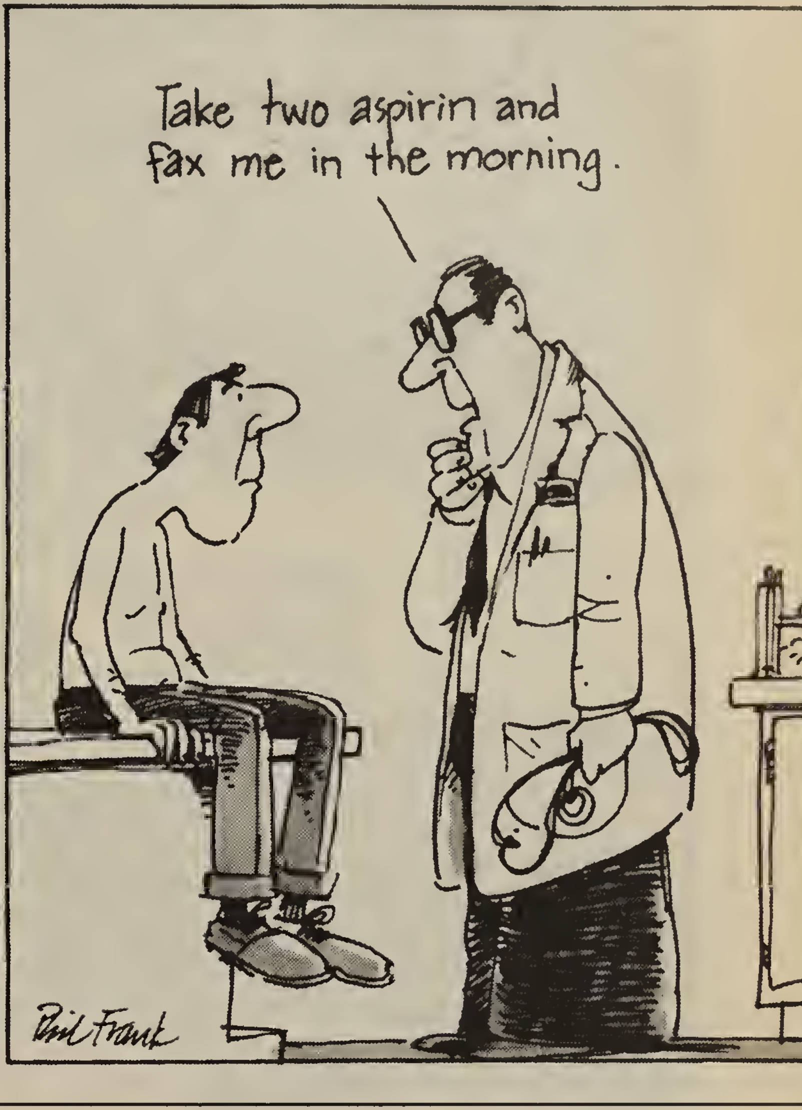
In the migration to OSI, we are likely to see the early adoption of those elements of OSI that provide a common infrastructure for system directory, network management and security. Vendor-proprietary applications will of course continue to be developed, but these will increasingly be on an OSI base instead of, or in addition to, a proprietary base of standards.

It all boils down to this: There is an inevitable need for a worldwide communications standard. OSI is the best candidate by far, and virtually every major systems vendor — as well as the federal government — now supports it. Clearly, OSI is poised for the next millennium. ◼

Elkind is vice-president of systems integration at Xerox Corp. in Sunnyvale, Calif.

TELETOONS

BY FRANK AND TROISE


Take two aspirin and fax me in the morning.
Bil Frank

LETTERS

Searching

"What you don't know about recruiters can hurt you" in your Oct. 3 edition attracted my attention, and I felt several points required clarification.

The article suggests that executive search firms do expensive advertising. In my 25 years in the recruiting business, I have never encountered a search firm that did any recruitment advertising. My sampling is small (I have been with three firms), but I am certain that Jim Kennedy, publisher of *Consultant News* and the *Executive Search Newsletter,* which is the bible of the executive search profession, can provide more reliable information on the subject.

There is also mention of executive search firms taking three months to produce a shortlist of very qualified candidates. Usually, firms complete the entire search in three months and the instances of exceeding that time span are very rare. We have never taken more than three months and have completed many searches within a month.

I do not agree that search firms are the most expensive. The client company is buying a portion of the consultant's time during which he or she will work solely on the client's

(continued on page 56)

Network World *welcomes letters from readers. Letters should be typed, double-spaced and sent to Editor,* Network World, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

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Manuscripts should be letter-quality, double-spaced and between 600 and 900 words in length. Disk or modem submissions are preferred.

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The VSAT primer

A short course for telecom managers on very small aperture terminals, their technology and applications.

By JOSEPH RINDE

A communications satellite is, in simple terms, nothing more than a microwave repeater. It receives signals of a particular frequency, amplifies those signals by a fixed amount and retransmits them at a different frequency to a large area below.

There are two limiting factors in a communications satellite. First, it operates over a limited frequency range; and second, as in any amplifier, there is a power limit beyond which distortion occurs.

Until a few years ago, the mention of satellite earth stations conjured up images of antennas 100 feet across. By contrast, satellite antennas used today for receive-only data applications measure as little as two feet in diameter. These very small aperture terminals make it practical to place satellite antennas at end-user locations.

A natural question is why satellite antennas were not made small in the first place. The physics of antennas is such that the radio energy collected is directly proportional to the surface area of the antenna. All else being equal, an 8-ft. antenna would gather a signal four times as strong at its focal point as a 4-ft. antenna. Thus, more power is required in the signal from the satellite to compensate for smaller antennas. More sensitive — and more expensive — amplifiers have also been used.

For earth stations that transmit and receive, the smaller antenna presents less of a reflective surface and, therefore, projects a very weak signal to the satellite, resulting in a weak signal being

(continued on page 53)

Rinde is director of product planning for Contel ASC's Data Networks Division located in Mountain View, Calif.

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Management Update

LAN management

Staying sharp

By MARVIN CHARTOFF and JILL MAURER

Attacking the problem of LAN management requires more than a knowledge of cutting-edge technology.

The landscape of local networking has been changing. Where there used to be simple garden-variety work group local nets, a jungle of multinet, multivendor local networks has sprung up to serve as an enterprisewide information resource.

The responsibility for hacking through this jungle of applica-

(continued on page 42)

Chartoff is a group manager and Maurer is a staff consultant with Network Strategies, Inc. in Fairfax, Va. Network Strategies is a practice of Ernst & Whinney that provides telecommunications consulting services.

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"Our college needed to enter the Information Age. But we weren't sure we could afford the price of admission."

For an educational institution, nothing is more important than the smooth exchange of information. That's why many colleges are making information networking a top priority.

The toughest challenge is connectivity. Colleges and universities, like most places, acquire computers and telecommunications hardware in patchwork fashion, ending up with little or no compatibility.

For one northeast college, AT&T Network Systems, working with the local telephone company, demonstrated that ISDN was the solution. Their information services manager explained: "ISDN gave us the best capabilities for the least cost. And we didn't have to trash our existing systems."

With central office-based ISDN, ordinary phone lines become the links in a fully interactive network. This translates into many applications and benefits. Voice and data can be transmitted simultaneously. For example, students and professors can confer with the Dean, who has on-line access to student records. Electronic mail streamlines interval communication, so course enrollment changes can be posted immediately. PC/terminal access to host computers and electronic file transfer extend every user's access to sophisticated software and multiple databases.

As the college's IS manager puts it: "ISDN can revolutionize the education experience. It's going to make us a better college. And, bottom line, a more competitive college."

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The right choice.

(continued from page 39)

tions and networks to a clear spot is devolving to communications managers. Willing or not, managers of wide-area networks are being given responsibility for local nets as well.

Changing environment

Local-area networks started appearing on the scene soon after personal computers showed up on users' desktops. The first local networks were relatively simple, tying together five to 10 personal computers in a work group environment.

As productivity improved in the small work groups, the word spread about how personal computers and local-area networks could be used to create large documents, share data base files and, in general, perform most of the functions previously available only with centralized time-sharing systems — but without the complexity and response-time delays typically associated with mainframe computers. Consequently, more organizations wanted to install personal computer local nets.

However, personal computer local-area networks developed independently of local nets that support terminals and minicomputers and that communicate with mainframes. Typically, a department decided on its own what product to purchase. As a result, the local networks throughout the organization came from different vendors, used incompatible technologies and stood as islands unto themselves.

Even if the protocols (for example, Transmission Control Protocol/Internet Protocol, Network Basic I/O System or Xerox Corp.'s Xerox Network Systems) and the transmission media (such as IEEE 802.X, Ethernet and token ring) were the same, network management could not be integrated if the network interface cards and servers came from different vendors.

Willing or not, managers of wide-area networks are being given responsibility for local nets as well.

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Further complicating matters has been the recent merger and acquisition activity in the U.S. This has created a hodgepodge of local-area network equipment within organizations. Planning for growth and expansion becomes very difficult when users have to deal with a variety of local-area network equipment in the acquired company.

The latest step in the evolution of local networks is the need to interconnect dispersed local nets using leased lines, packet switching or T-1. The wide-area network can be used to provide a transport service among local-area networks or to allow users on one local net to access host resources. In either case, local net management capabilities today are typically not well-integrated with wide-area network management systems.

Thorny issues

Several thorny issues face communications managers as they inherit the role of local-area network manager. In addition to the immediate problem of getting acquainted with a new system, there are the chronic problems inherent in that network.

Among the manager's initial concerns must be the installation of the local-area network and its management system. Few local nets are handed to the manager in smooth operating condition. Integrating independent local-area nets or, tougher yet, integrating local nets and wide-area networks into a single, seamless network in a way that can be easily managed are feats often compared with parting the Red Sea.

The "cutover," a term that implies an instant, transparent transition, can drag on for weeks or months. Months of preparation may be involved before the actual cutover begins. This preparation includes testing, debugging and retesting the hardware and software components of the network and the network management tools until they perform well enough to be put on line.

New local network managers also face the problem of training, both for themselves and staffers. The formally educated local network manager is rare indeed.

Most companywide networks evolve from several independent local nets, resulting in many different configurations. With the number of different products, devices and transmission media available today, the combinations are endless. No formal course could include everything network managers need to know about their networks.

More often than not, the causes of problems must be hunted down, and the only knowledge that allows a head start is an understanding of the history of the individual network's problems. Unfortunately, accurate trouble logs are usually unavailable.

Even after the successful implementation of the network, issues such as the effect of growth on the performance of the network continue to plague the manager. Speed and reliability can be affected by an increase in traffic. The local network manager must be able to collect traffic statistics and perform capacity planning analyses.

In complex networks composed of many local nets, the problem of finger-pointing during troubleshooting is exacerbated by the number of components in the path of a typical user's session. Not only are the network management systems of the components not integrated, they may also be measuring or identifying problems using different terminology or definitions. As a result, the task of relating errors becomes more difficult — if not impossible.

A local network manager may be responsible for local nets at several sites — some with technical personnel available for troubleshooting, others with only end users. At remote sites with no technical people, the manager must be able to monitor and control network devices.

Walking an end user through a troubleshooting sequence is even more complex in a multivendor environment. The manager needs accurate configuration information to identify the user's equipment.

The ability to overcome these problems enables a multivendor, multinet network to appear as seamless as possible. Activity in the international standards arena may help, but this will depend on what standards are agreed to and how quickly vendors implement them in their products.

The solution?

The International Standards Organization has recently begun to expand the Open Systems Interconnection reference model to include network management standards. These standards define how network management systems should issue commands and extract information from network elements.

The Common Management Information Protocol (CMIP) is the standard protocol for this exchange. CMIP applies to both wide-area network and local-area network environments.

The model of the OSI management environment includes the following five major functions:

■ Fault management. Fault management enables the communications manager to detect, isolate and correct a problem in a disabled network. Included are standards for maintaining a data base of network failures and their causes, called the fault report log; for defining a method to analyze this log to determine the proper corrective action; and for developing the method to carry out the repairs.

■ Configuration and name management. This function allows the monitoring and manipulation of information on the characteristics of network elements. Examples include routing tables, port addresses, line speeds and protocols. Also provided are inventory management and directory maintenance services.

Inventory management enables maintenance of current, detailed information on network equipment, including financial and historical information. Directory maintenance services allow maintenance of current information on applications and hosts, such as which applications a device can access and the security access privileges of a particular terminal or user.

Configuration and name management is of particular use in an environment of integrated local-area networks or wide-area networks; it allows information about the entire network to be organized in a logical manner.

For example, symbolic names, such as "NYC HostA," permit the computer to interface with the network without the user needing to know its actual location. This capability is very important for adds, moves and changes of both user devices and computer resources.

The merger and acquisition activity in the U.S. has created a hodgepodge of local-area network equipment within organizations.

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■ Performance management. This function defines the methods of tracking and graphically displaying the performance of the network, including network and component availability, utilization and response times. Also included is the ability to modify the network in order to observe and record network performance. Performance management functions are designed to help the communications manager meet predefined service-level objectives.

■ Accounting management. This defines a standard for determining the costs of providing network service to users for billing purposes. Included in accounting management are provisions for determining cost allocation, setting and enforcing accounting limits, and reconciling bills and services.

■ Security management. A data base called an "authorization facility" maintains a record of the privileges of a particular user with regard to certain aspects of the network, such as hosts, directories and files. For example, each user may be assigned either read-only, write-only or read/write privileges for individual files on a file server. Access control functions restrict access according to the information maintained in the authorization facility data base. Also included under security management are provisions for message encryption and user authentication.

These five major categories of network management functions define the types of commands and responses necessary to perform network management, but how that information is integrated among vendors and technologies and how net management services are presented to network operators are still unresolved issues for vendors.

Standards provide a basis on which network management systems can be developed. The characteristics and capabilities of network management tools promise to be an area of heated competition among vendors.

The ideal management tool

First and foremost, the ideal local-area network management tool must support a multivendor environment and must be well-integrated with wide-area net management tools. Local nets are becoming integral to the corporate enterprise network. The network management capabilities available to a communications manager cannot be segmented into local area and wide area.

Second, the ideal local net management tool must be more than just an executive reporting tool. It must also be useful at the hands-on level. It must allow smooth operation of the network and planning for future growth.

In addition, the ideal management tool must scale easily from small, single-segment local nets to large, bridged networks spanning multiple sites.

The OSI network management model specifies the five functional areas of concern. But how would the ideal management tool address these?

■ Fault management. The tool must be able to detect, diagnose and restore problems relating to transmission media, protocols, interface cards, network resources and network software. It should alert the end user, as well as the designated management centers, to any problems. And it should provide not only hard-copy printouts of alarms but also store the alarms in a data base.

Upon receipt of one or more alarms, the management tool should initiate an expert system analysis that attempts to identify the problem, run diagnostic tests if required and restore service. The expert system will draw upon histories of past problems as well as results from recent performance tests. It would require little human intervention, except to override actions that could have a significant impact on users.

■ Configuration and name man-

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Three LAN viewpoints

What you see depends on who you are and where you stand.

CONTINUED FROM PAGE 1

the same time.

These overlapping claims to local-area network competence stem from the special character of this technology, according to Howard Frank, chairman of Network Management, Inc., a systems integration and facilities management firm in Fairfax, Va. "People are always saying that computer and communications technologies have merged," says Frank, "and the LAN is the best example of that. You need a mix of MIS and telecom skills to manage LANs.

"On the one hand, it's like managing a wide-area network," he explains, "because you have to deal with congestion phenomena. On the other hand, it's like managing a computer system in that you have to concern yourself with operating systems, directories and security matters."

The third group in the local net management triumvirate — end users — has gotten involved through simple necessity, says Frank. "You have a situation similar to the introduction of minicomputers or PCs into organizations. Mainframe-oriented MIS groups were not responsive to users' business needs, so users have quite often taken the initiative and set up their own departmental systems. At the same time, the task of managing the local nets has often fallen to users simply because MIS and PBX-oriented telecom groups have been unwilling in many cases to touch it."

A necessary distraction

What all three groups have in common is that none of them really wants the job of local-area network management, yet none wants to fully relinquish it either. Users and managers, who generally support their immediate work group of local-area network users, consider it a distraction from their main responsibilities.

Brad Baldwin, a local net market analyst at Dataquest, Inc. in San Jose, Calif., manages his work group's local-area network. "I support a 12-user PC LAN that has a gateway into a bank of DEC minicomputers upstairs," he says. "It's time-consuming work because I have to walk around responding to problems and complaints.

"For example, I may have to troubleshoot a hardware glitch in a user workstation, deal with a shortage of disk space on the file

(continued on page 51)

Kobielus consults on information technology in Alexandria, Va.

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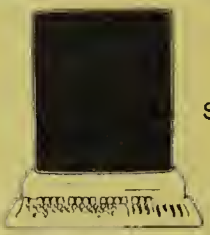

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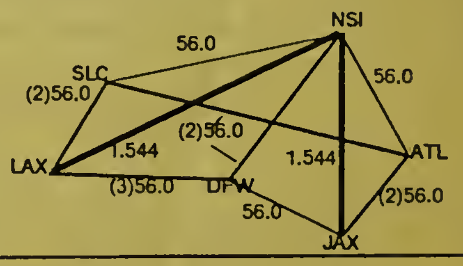

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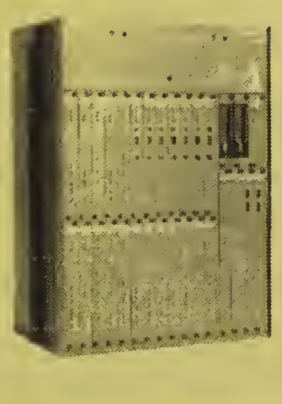

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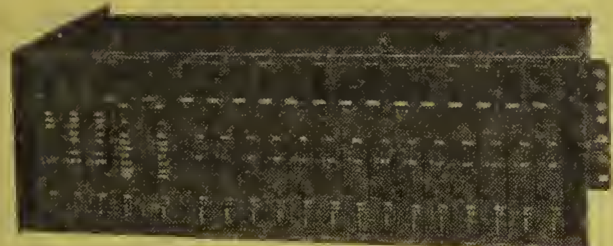

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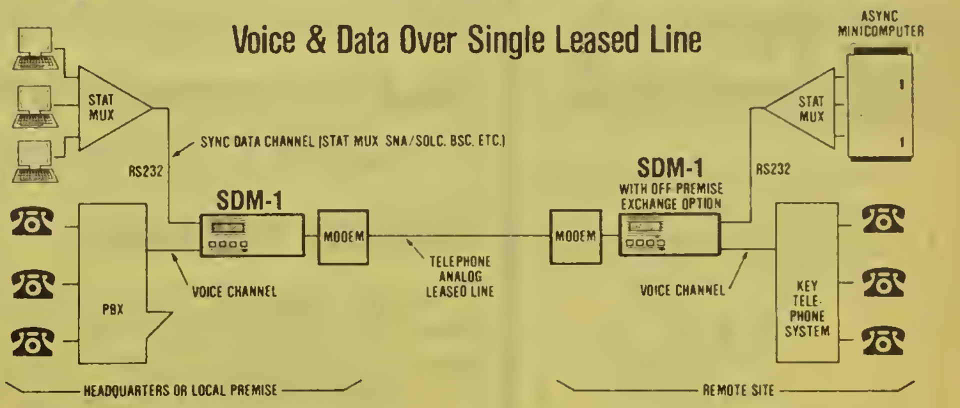
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Staying sharp

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agement. The tool should allow users to customize configurations and store the configuration parameters in a data base that other components of the management tool can access.

Examples of configuration parameters include protocol, line speed, access privileges and priority of users. The configuration should also include information on users assigned to each network device, such as name, phone number, organization and typical applications used. The tool must also support network name services by converting symbolic names to a network address.

This directory function should be compatible with the CCITT X.500 standard for directory services. The management tool should also detect new devices added to the network and poll the device to collect relevant configuration information.

- Performance management. The ideal management tool must provide information for capacity planning and determine what service levels are being provided to users. The tool should record performance parameters such as response times, throughput, availability and utilization. These measurements must be categorized by destination and must distinguish between local segment and off-net traffic.

The tool should be able to identify bottlenecks in the overall network design and recommend configuration changes to overcome them. Graphical reports should show service levels being provided in summary form.

- Accounting management. The local net manager must be able to allocate costs for the network back to the individual users of departments. The tool must keep track of call durations, traffic transmitted and network resources used.

While chargeback systems are not typically used for purely local environments, the tool should be able to interface with the wide-area network accounting system to provide single billing capabilities.

- Security management. The management tool must provide access control to the network and network resources by requiring users to enter an identification and password before initiating a session. It should control what resources a user can access. Records of all security violations should be copied onto a data base log. The tool should control dial-in access from off the network and external access for on-net devices.

What is available today?

Only some of the features described above are available in products today. Local-area network tools can be classified into two categories: network analyzers (technician control equipment) and network controllers (management systems).

Several network tools in each of these categories are on the market today. The network analyzer examines the bits and bytes for protocol errors or specific sequences. It has the ability to look at the network but is not able to modify it. The analyzer aids troubleshooting by passively monitoring local network activity and producing bar graph displays of gathered statistics.

Some products generate test packets that create more network traffic or simulate particular protocol sequences. However, testing decreases throughput on the network because the test frames compete with the live traffic for available bandwidth. Examples of a network analyzer are the Network General Corp. Sniffer, Excelan, Inc.'s LANalyzer and FTP Software, Inc.'s LANWatch.

Generally, the network analyzer only monitors traffic whose source or destination is located on the same segment of the local-area network as the analyzer. The exception is when the local net is used as a backbone and traffic is just passing through that segment.

Bridges, routers and gateways filter locally directed traffic, thereby preventing the analyzer from monitoring traffic that is not transmitted through its segment of the network. For this reason, an individual analyzer is required for each segment and the communications manager must provide the necessary interface between them.

Because the network analyzer neither performs network modifications nor monitors activity on remote segments of the network, it has limited ability to aid the communications manager in troubleshooting interconnected local- and wide-area networks. Although network controllers are far from the ideal tool, they take the next step toward a complete network management device.

Network controllers can perform network administration functions, such as configuration management, as well as many of the functions of a network analyzer. Network controllers designed to support vendor-proprietary local networks and terminal server networks, such as products from 3Com Corp.'s Bridge Communications division, Ungermann-Bass, Inc. or Sytek, Inc., include both configuration management and access control functions.

For example, statistics such as connection addresses, session duration and connection traffic can be collected for each terminal in addition to the statistics collected for the network nodes. The network controller provides good capabilities for networks composed of bus interface units (BIU) and network interface cards from a single vendor.

A network controller can also activate or deactivate network devices, such as BIUs, bridges and file servers, anywhere on the network.

However, multivendor networks will need multiple network controllers. Today, these network controllers cannot exchange information or views of the network. Until network controllers from different vendors have the ability to communicate and the intelligence to work together to troubleshoot problems on the network, a staffer will be required to monitor the devices that monitor the network.

Ideally, the entire network would be using the same protocols to exchange information among network elements and network controllers. To maintain a network's long-term flexibility and useful life, it is important to choose vendors committed to supporting the standards that lead to the ideal goal.

Conclusion

A significant gap exists between the ideal and what is available today. The major shortfall in today's products is that they are geared toward monitoring individual local-area networks. The few tools that can control networked local nets ignore the existence of wide-area networks.

Once traffic is off the local net, the network management tool is out of touch. As network management standards that cover both local-area networks and wide-area networks are developed and implemented, that limitation should be alleviated.

Getting to the ideal will take time. It will require communications managers and vendors to change their views on local network management. Just as change was required in file management when personal computers went from stand-alone devices to members of local nets with file servers, so must local net management adapt to the change from stand-alone local nets to integrated enterprise networks.

Three LAN viewpoints

continued from page 43

server or change a password. All of these very necessary administrative chores take time away from my primary work as an industry analyst."

Frank sees a potential hazard in entrusting departmental local-area network management exclusively to users. "What do you do when the work group support person leaves or the LAN outgrows the department?" he asks.

> MIS and telecommunications people generally interpret connectivity and resource sharing in different ways.

Small departmental systems can be managed capably by users, says Charles Finkelstein, a local-area network consultant at the U.S. Department of Transportation's Transportation Systems Center in Cambridge, Mass. He notes, however, that there is a clear need for MIS and telecommunications people to take more active roles when users attempt to link separate work group local nets or patch into corporate computing resources.

"Interdepartmental LAN connections need to be supervised by a committee consisting of user, MIS and telecom personnel," Finkelstein says. "The committee must oversee such critical matters as [local-area and wide-area network] interfaces and common internetwork protocols."

These broader architectural issues are the meat and potatoes of both the MIS and telecommunications departments. For their part, users generally aren't as concerned with the specifics of network configuration as they are with maximizing their access to on-line resources. "Users have their own imperatives for productivity," says Ed Ward, network services manager at American Management Systems (AMS), a management consulting firm in Arlington, Va. "They see LANs as a straightforward issue of connectivity and resource sharing."

Contrasting perspectives

When it comes to local-area networks, these two factors — connectivity and resource sharing — are also prime concerns of telecommunications and MIS people. However, the two technical groups generally interpret the notions in different ways and consequently propose divergent networking solutions.

Connectivity, to many telecommunications professionals, means linking voice and data devices primarily through telephone switches and twisted-pair wiring, according to Larry DeBoever, a networking consultant and principal with DeBoever and Associates, Inc. in Acton, Mass.

"The telecom guy will look at a Northern Telecom or IBM/Rolm [Systems Division] data-over-voice PBX-based solution," DeBoever says. "I've never seen a telecom person who's interested in a stand-alone data LAN. Telecom professionals are also more likely than MIS to look into

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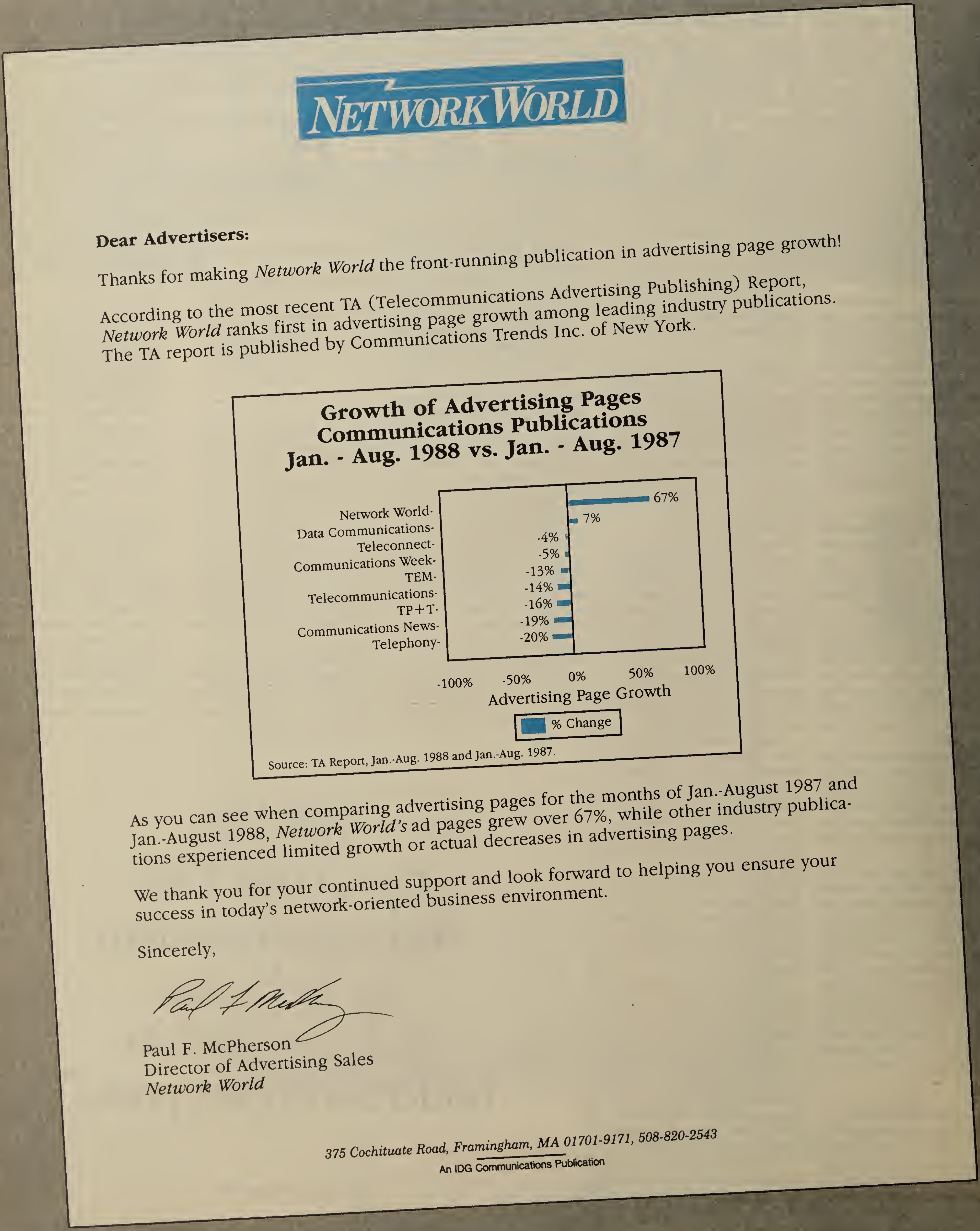

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Three LAN viewpoints

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telco-provided central-office local nets."

Telecommunications professionals generally view local-area network connectivity in terms of hardware. In particular, they are concerned with cable and wiring schemes, says Marvin Chartoff, group manager at Network Strategies, Inc., a consulting firm located in Fairfax.

Robert Bursick, telecommunications director at Wayne State University in Detroit, is typical in this respect. Bursick is pursuing a connectivity strategy that will tie departmental local-area networks together across a campus-wide fiber-optic backbone. The central controller for the campus network will be a Northern Telecom DMS-100 switch located in a nearby Michigan Bell Telephone Co. office.

By contrast, MIS generally opts for pure data local-area network and wide-area network solutions in which connectivity is primarily a function of specialized software. DeBoever says, "The MIS person doesn't want to get caught in a voice system. He or she will always opt for a private data network."

MIS concentrates its connectivity efforts on implementing server-resident network interfaces. "MIS is principally concerned with the protocol standards for interconnecting diverse LANs," says Chris Pilloton, manager of systems integration at Schering-Plough Corp. in Union, N.J.

"In our organization, requests for LAN installations generally come up from user departments," Pilloton says. "What MIS does is work with users to develop and install server-resident gateways and emulators tying departmental LANs into corporate data processing and network management systems."

Resource sharing, local net-style, is also a subject that MIS looks at from a software point of view. MIS sees it as an issue of data and application management — that is, how best to secure and configure files and functionality across the local-area network. By contrast, telecommunications people look at resource sharing in the more general, hardware-flavored terms of voice/data integration.

Marc Kustoff, manager of human resources information systems at the Rorer Group, Inc. in Fort Washington, Pa., describes the MIS perspective on resource sharing in local net and wide-area network environments.

"MIS is concerned with implementing application-to-application interfaces across the [local-area/wide-area network] at the upper levels of the OSI seven-layer reference model," he says. "Telecom, on the other hand, is concerned principally with the lower levels of OSI.

"The MIS perspective on networking," Kustoff says, "is more strategic in nature."

This view of MIS and telecommunications perspectives as polar opposites is echoed by Stuart Wecker, president of Sudbury, Mass.-based consultancy Interface Design, Inc. and principal developer of DEC's DECnet local net. "MIS worries about higher level issues," says Wecker, "such as performance at the disk-access level, at the server. Its concerns are such matters as file access, access control, security and file-naming conventions. Telecom is worried about lower level issues such as transmission capacity and bandwidth."

> "MIS should look at LANs as a threat," says Ed Ward, "since users are finding solutions outside the traditional monolithic mainframe environment."

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According to Network Strategies' Chartoff, MIS "keys in" on local-area network servers when configuring the system. "It asks such questions as what applications should reside on the server, how much processing power should go there and which applications should be distributed between the server and other network nodes."

A custody battle

Still, few regard local-area network management as strictly, or even primarily, an issue of dueling technical perspectives. It's viewed essentially as an intra-organizational battle for custody and control of a fast-emerging network solution. What's at stake is the balance of organizational power among MIS, telecommunications and users groups.

Many observers believe MIS has proven itself the more fit parent. "MIS is being given more say over the purchase of user work group LANs due to the pressing need for standardized interconnections among local nets," says Claire Fleig, director of research at the International Technology Group in Los Altos, Calif.

Fleig rebuts frequently heard arguments that MIS is expanding its organizational influence out of selfish motives. "It's a misconception that MIS directors are trying to control the network because their jobs are at stake. MIS has traditionally been tasked with data security matters, and there's a great need in LAN environments for data and usage to be tracked, secured and audited."

Management of local nets is often dumped in MIS' lap by default, says Timothy Becker, manager of network engineering at LanQuest Group Corp., a system engineering and consulting group in Santa Clara, Calif. "MIS is often much more prepared than the telecom group to implement internetworking solutions," Becker says. "It's often an easy and natural step for MIS to take on LAN management."

Still, Becker sees an opportunity for enterprising telecommunications managers to take on responsibility for local-area networks if they act decisively. "MIS already has its hands full with data processing chores, which means that the telecom group can take over LAN responsibilities if it's ready and willing."

Ward of AMS is one of those who argue that local-area networks are the salvation of the telecommunications group. "LANs are job security for communications people," he says. "LANs are a communications technology. Users come face-to-face with such matters as connectivity and standards and will need to talk to somebody who does this for a living.

"On the other hand, MIS should look at LANs as a threat," Ward continues, "since users are finding solutions outside the traditional monolithic mainframe environment."

All such issues aside, local-area network management often is an organizational matter on which there is no clear division of responsibilities. "For the most part," Frank says, "the MIS and telecom groups are simply not addressing the subject. Not many technical professionals are worrying about it, which is why work group LANs are predominantly managed by nontechnical users."

A triad

Most likely, local net management will remain a shared responsibility in many organizations. The Transportation Department's Transportation Systems Center is exemplary in this regard. At the center, MIS owns the central backbone to which all user work group local networks must connect. Each department provides technical support on its own work group local net and calls on MIS and telecommunications people for support on interconnecting to the backbone.

The Department of Transportation's Finkelstein says, "Responsibility for managing LANs is spread among users, MIS and telecom. But to keep control over it all, we maintain a LAN oversight committee consisting of representatives from all three groups. We also maintain a central LAN contact person in MIS. There must always be at least one technical person — MIS or telecom — supporting user departments' LAN activities."

Shared responsibility can be a constructive arrangement. It allows an organization to pool the business and technical know-how of user, MIS and telecommunications groups. It prevents local networks and local net management from falling captive to one department and its limited perspective. The payoff from shared responsibility can be an organizationwide perspective on local-area networks, their applications and their usage. ◼

The VSAT primer

continued from page 37

returned to earth.

Both of these limitations have been addressed by "mating" the VSAT with a master earth station that acts as the hub of a star network. The master station transmits a high-power signal to the satellite to compensate for the receiving limitations of the VSAT.

To make up for weak signals sent by the VSAT, the hub uses a large antenna (five meters to 32 meters in diameter, depending on the frequency and the satellite used) to provide a collecting area large enough to accumulate sufficient energy from the low-density VSAT signal.

Terminal protocol support

A well-known attribute of satellite transmission is the propagation delay — approximately .54 seconds — associated with the distance the signal must travel. Since most communications protocols were designed for use with terrestrial lines, this delay has serious effects on performance. It is necessary to mask this delay for acceptable communications. This can be accomplished by protocol emulation within the satellite network.

Protocol emulation is used to decouple the link-level protocol between the host computer and the user's workstation, which may itself be a computer. In a traditional polled environment, for example, a host computer interface emulates all the controllers on a multidrop line by responding to polls addressed to each controller.

In the VSAT environment, the host is connected to the hub by a point-to-point line. At each VSAT earth station, polls address the controllers or workstations that

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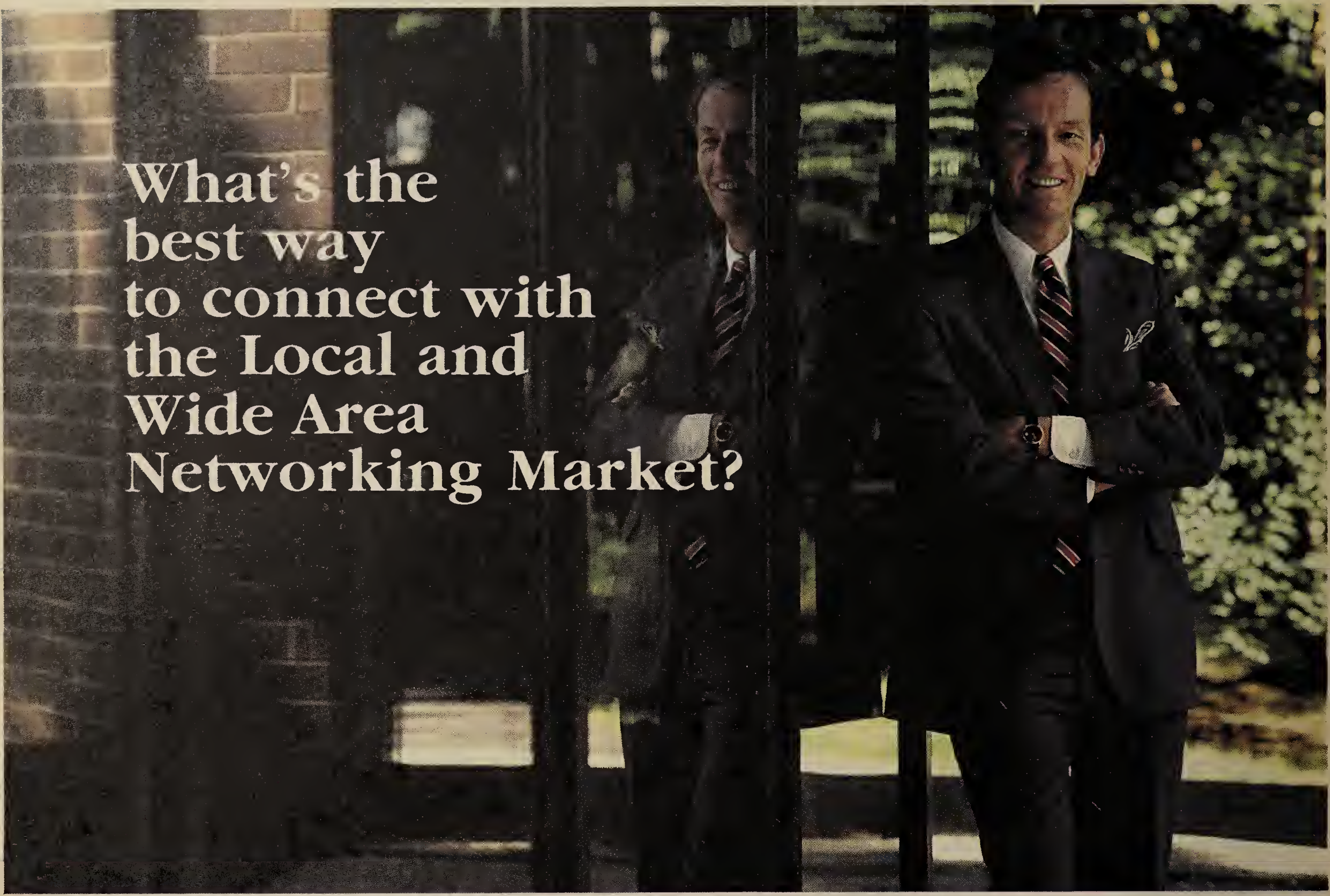
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are actually attached to that station. When a controller responds to a poll with data, that data is sent through the satellite link to the hub. Then, in response to the host computer's next poll of that controller address, the data is sent over the point-to-point line to the host.

In this way, only data is sent through the satellite. This not only reduces response time, it also minimizes the satellite capacity needed to share among the VSAT population. Reducing capacity needs is significant since most polls result in an indication of no data.

Appropriate applications

Data broadcast is a natural application for VSATs. Information providers can supply real-time updates of timely information such as stock quotes, commodity prices, news and weather. By offering intelligence and storage at end-user locations, information providers can create and update a distributed data base in real time. The user can then interrogate the data base locally, giving the appearance of an interactive system with very fast response time.

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Voice transmission, although possible, isn't really cost-effective, partly due to the star nature of a VSAT net (voice calls usually require a mesh topology) and partly due to the cost of satellite capacity in a VSAT environment. Voice by VSAT may become more viable in the future, however.

VSAT networks are well-suited for transaction applications because a large number of VSATs can share a single channel of satellite capacity, typically a single frequency. If 1,000 VSATs (representing 1,000 or more user terminals) can share a single channel, the statistical properties of the transactions can be used to great advantage.

First, statistical predictions are far more reliable when applied to large populations. Second, the selection of which VSATs share a channel is not constrained by geography.

Thus, in a national network, VSATs from all four time zones can share a common capacity pool. With typical peak usage at 10 a.m. local time, the peak East Coast traffic occurs while West Coast commuters sit in their cars. Later, West Coast peak traffic occurs while East Coast workers are finishing lunch. The reduction in peak satellite capacity required can be significant.

Transaction applications represent a large segment of VSAT usage. Examples of these applications include automated teller machines, credit authorizations and other point-of-sale functions as well as general inquiry/response applications. This last item may include insurance agents checking policies or claims, data base inquiry, order entry, creation of bills of lading, reservation systems (such as airlines or car rentals), electronic mail and inventory control.

Even applications that require an infrequently used return path can be supported with a receive-only VSAT and a dial modem. Two trading networks currently operate in this manner. One net is used by rare coin dealers, the other by dealers of used auto parts.

In both cases, a personal computer-based user workstation maintains a listing of items recently put on the market. The user initiates a trade through a keyboard command that results in a dial connection to a local value-added network (VAN) access point. The transaction is made through the VAN, and the dial connection is terminated.

When infrequent transactions are made from a single location, this is the most economical means of providing the service and a nice example of the complementary nature of satellite and copper or fiber media.

Process control applications

Typically, process control applications have a known frequency of transmissions from remote sites, representing periodic status updates to a central point. Exceptional conditions or emergencies may result in unscheduled transmissions from the field.

> For remote locations such as electrical generation substations, VSATs are often the most economical or only means of access.
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Based on the reported data and operational plans, commands are sent to the field to effect changes. Many of these networks involve remote locations where VSATs are the most economical or only means of access. Examples are oil pipelines and electrical generation substations.

If users can stagger their periodic reports from the field, they can achieve considerable reductions in peak satellite capacity. Even where status readings must be taken throughout the network simultaneously, VSATs can be used for timing, thereby keeping satellite use to a minimum.

In a VSAT network used to monitor a power grid, broadcast commands can synchronize measurements throughout the grid. The transmission of the simultaneously collected data is then staggered by the VSATs to avoid congestion of the satellite channel. This in turn reduces the size of the satellite channel required. The only constraint is that all the data must be sent before the next measurement is made.

Internal network operation

By emulating the protocols used between the host computer and the workstation, the VSAT network can pass data in a way that makes efficient use of the satellite capacity.

A protocol similar to High-Level Data Link Control that has a large window size is typically used. Such a protocol permits multiple packets to be sent in either direction between a VSAT and the hub station before an acknowledgment is required. This compensates for the turnaround time due to propagation delay and allows data to be continuously transmitted.

The two directions of data travel have different properties in a VSAT network. The transmission from the hub to the VSAT, called outbound, is the simpler of the two. This can be thought of as a single speaker with many listeners. The inbound direction is more complex — like many speakers with only one listener.

On a single outbound channel, the hub transmits packets of data to VSATs on a demand basis. This form of statistical multiplexing allows many VSATs to share an outbound channel by taking advantage of the statistical nature of the communications.

Outbound channels in existing networks range from 19.2K bit/sec to 512K bit/sec, with typical values between 128K bit/sec and 256K bit/sec. An outbound channel operating at 153.6K bit/sec can generally support more than 1,000 VSATs performing transactions.

An inbound channel supports multiple VSATs contending for transmission on the channel. A number of schemes can be used to resolve contention among several transmitters sharing a channel. Classical sharing schemes for a satellite channel are demand-assigned time-division multiple access (TDMA) and frequency-division multiple access (FDMA).

Both schemes require the transmitter to request transmission authorization from the hub and then wait for it to be granted. TDMA grants permission based on a time slot within a transmission frame on a known frequency. FDMA assigns a frequency to be used exclusively by the transmitter.

Both of these "Mother, may I?" disciplines require some setup time. Since the request and the permission must both travel through the satellite network, a delay of more than half a second is experienced. For file transfer applications, this is of no consequence. However, for transaction applications that are response-time sensitive, this may be a high price to pay.

A more recent sharing scheme was developed at the University of Hawaii for radio networks. Called Aloha, the scheme as-

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sumes a channel capacity far in excess of user demand. Remote stations transmit at will and assume that no other station is transmitting at the same moment. This "transmit and pray" technique is similar to Ethernet. If two transmitters do send at the same time, the transmission is unintelligible to the receiver.

After a predetermined period of time — called the time-out period — each sender notes the lack of acknowledgment from the receiver and retransmits. To avoid repeated collisions, a random time delay is inserted by each sending station before retransmission.

In VSAT transmission, a channel of 56K bit/sec is typically used (at speeds from 32K bit/sec to 128K bit/sec) to support earth stations (usually 100 or fewer). Due to satellite propagation delay, retransmissions add considerably to response time.

The time-out required to trigger a retransmission must be approximately one second to allow for the propagation delay, transmission times (in and out) and querying at the hub station. This time-out period, coupled with the transmission time and propagation delay for the second transmission, accounts for the significant effect on response time caused by collisions.

Unlike an Ethernet local net, the advantages of CSMA/CD cannot be applied to VSATs since they cannot hear one another's transmissions.

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A random Aloha channel, where any station may send at any time, reaches saturation at 18% of channel utilization, or 10K bit/sec for a 56K bit/sec channel. The reason for this limit is that beyond 18% utilization, the frequency of collisions results in so many retransmissions that future collisions are guaranteed; actual channel throughput goes to zero.

By synchronizing all stations to start transmission at the beginning of a time slot, the theoretical saturation point becomes 38%, or 21.3K bit/sec of a 56K bit/sec channel.

However, slotting introduces other wasted channel capacity since not all messages are exactly equal to the slot size. The unused portion of a slot is wasted capacity but is counted in the 38% saturation figure.

The true usable capacity in a slotted system is somewhere between the 38% theoretical "slotted Aloha" value and the 18% of random Aloha. Due to the adverse impact of collisions on response time, normal operation of a slotted Aloha channel is 10% to 20% slot usage.

There may be unused space within a slot. This occurs if a packet is smaller than the slot size or when an acknowledgment of an outbound message is sent in a full slot even though there is no data in the slot. Accounting for this unused space, a 56K bit/sec channel represents approximately 5K bit/sec of transmitted data, including internal packet overhead. After overhead, actual user traffic is 3K to 4K bit/sec.

Throughput vs. speed

It is important to note the difference between speed and throughput. These two capacities are often thought of as synonymous, but they are actually independent measures of systems. The preceding example of an Aloha channel demonstrates the difference in these measures.

Unlike an Ethernet local net, the advantages of carrier-sense multiple access with collision detection cannot be applied to VSATs since they cannot hear one another's transmissions; only the hub can hear them.

Even if VSATs could hear one another, CSMA/CD would be of little help. First, sensing the carrier only tells the activity of the carrier a quarter of a second ago due to propagation delay. Second, for the short messages typically sent for transactions, collision detection would occur after the transmission is complete. The one advantage of collision detection, if it were possible, would be to allow an earlier retransmission to reduce the impact of collisions on response time.

It is technologically possible to detect which VSATs are involved in a collision by adding a signaling channel in which the VSAT can inform the hub station of its transmission activity. The cost of this additional channel may be partly offset by improved utilization of the Aloha channel and improved response time, which may reduce the number of Aloha channels needed in the system. Systems that use this approach are not currently commercially available.

Another recent sharing scheme is based on spread spectrum technology. Originally developed for military transmission, spread spectrum signals use a wide bandwidth to spread the power of the signal. This compares with conventional radio signals that concentrate power in a small frequency range. The spreading results in a low signal-to-noise ratio that makes detection or interception of the signal difficult. The low signal-to-noise ratio also increases the likelihood of erroneous reception by the intended receiver.

This problem is overcome by sending multiple symbols, or chips, per bit throughout the frequency range used. As long as enough of the symbols come through correctly, the data bit can be identified. It is this property of spread spectrum transmission that is used for multiplexing in a VSAT inbound channel.

Using a pattern of 2,048 chips per bit, a VSAT system multiplexes based on a set of distinct patterns or codes. Multiple VSATs (in practice, more than 1,000), each with a unique code, can share a channel and transmit at will, often with multiple transmissions at the same instant in time. The multiplexing is not based on time or frequency but on code; hence the name code-division multiple access (CDMA).

Demodulation equipment at the hub station monitors the incoming signal for the codes representing the VSATs on that channel. The use of unique patterns makes it possible for the demodulation equipment to recognize the presence of a particular VSAT's code.

Using a 2,048 chip-per-bit pattern, thousands of distinct codes are possible. The same codes can be reused on different inbound channels. With a pattern this long, a 1,200 bit/sec data stream can be sent in 5 MHz of bandwidth.

Up to 100 simultaneous transmissions can be accommodated on a single frequency, with a bit error rate of 10-7 or better. This gives the channel a throughput of 120K bit/sec at a data rate of 1,200 bit/sec.

Both Aloha and CDMA have been used effectively to provide economical usage of inbound VSAT channels. The two techniques provide complementary sets of capabilities.

Future VSAT systems will continue to operate in C- and Ku-bands.

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Satellite frequencies

Current VSAT systems utilize two frequency bands, C-band (4 and 6 GHz) and Ku-band (12 and 14 GHz). These are the nominal frequencies used, with the higher frequency for transmission to the satellite and the lower frequency for reception from the satellite.

C-band is the dominant frequency in use for receive-only VSATs with antennas as small as two feet in diameter. Ku-band antennas of that size for receive-only recently became commercially available, but they represent only a small number of the installed base.

Both C-bands and Ku-bands are used extensively for interactive VSATs. C-band offers weather-insensitive reception for low data rate applications. Spread spectrum is used in part for its response time stability and in part for its ability to coexist with terrestrial transmissions on the same frequencies. Spread spectrum facilitates this coexistence in two ways:

First, it offers resistance to interference from terrestrial microwave sources; and second, the power density of the transmission is so low that it offers minimal interference to terrestrial microwave receivers.

A system using C-, Ku- or Ka-band to receive and L-band to transmit could offer an economical system for low-capacity input with a higher capacity output.

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Ku-band provides higher speed transmissions for applications with high concentration points or larger message sizes. In both cases, the reduction in transmission time achieved by the higher speeds is needed to provide the required response time. The loading of Aloha channels is also tailored to the response time requirements.

Future VSATs

Future systems will continue to operate in C- and Ku-bands. Then, as now, the choice of a VSAT system will be based on capabilities, performance, vendor support and price. Additional frequencies may also come into use.

The Ka-band (20 and 30 GHz) may have some applications. The weather attenuation in Ka-band is more severe than in Ku-band but is compensated for by the use of many "spot" beams that cover a wide geographic area. The limited area covered by a single spot beam requires on-board switching between beams within the satellite. The economics of this approach are still in question.

L-band (1.5 and 1.6 GHz) is currently assigned by the Federal Communications Commission to mobile location services. The wide spacing of these satellites allows the use of small antennas without interference from adjacent satellites.

Due to the limited bandwidth, it is possible to take advantage of the satellite spacing to offer VSAT services utilizing low data rates. These services may offer a mobile capability for VSATs.

A hybrid system using C-, Ku- or Ka-band to receive and L-band to transmit could offer an economical system for low-capacity input with a higher capacity output.

The prospects for more economical voice capability are good. This is due to a combination of improved voice digitizers and more efficient satellite channel-sharing schemes. Most applications of voice, however, are likely to be in Third World countries and in out-of-the-way locations typical of pipeline and well head operations.

Integrated data and video transmission in a low-cost unit is further in the VSAT future. Current compression schemes can produce a quality video picture in 112K bit/sec supported by a dedicated VSAT. Today's technology is also capable of compressed video at 56K to 64K bit/sec, but the quality is low.

Further work in this area will produce an acceptable-quality picture that can be more economically transmitted via VSAT.

The prospects are that VSATs will coexist with and become a part of Integrated Services Digital Networks. Now being studied actively, use of VSATs in ISDN networks is another example of how satellite and terrestrial media complement each other.

Letters

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assignment. However, when all the factors are considered, the question remains as to whether the retainer search is the most expensive. On our last four assignments (for three directors and one manager), we submitted nine candidates, of which six were interviewed and four were hired. We, therefore, did not average two interviews per assignment.

Adding three or four hours for the initial meeting to agree upon job specifications and the like yields the total time expended by the client. Compare that with countless telephone calls, interviews and resumes to be reviewed from a contingency search organization and the approaches become more equal. Also, the aggravation factor is much smaller with the retainer search concept.

Ralph Owen
President
Kiley-Owen Associates, Inc.
Philadelphia

TOPS cites growth since acquisition

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vice," Shapero noted.

In the market segment for IBM Personal Computer networks, TOPS currently has less than 5% of the market. But its piece of the pie is getting larger, according to Infonetics figures.

TOPS is the undisputed leader in the segment of the market for mixed local-area networks, which are nets that feature both Macintosh and IBM Personal Computers together, according to Infonetics.

"In this particular segment, TOPS has the largest market share today — well over 40%," Seidler said.

While Seidler predicted that by 1991 Novell will surpass TOPS in the mixed network segment of the local net market, he said he sees no end in sight to TOPS' growth.

"TOPS exploded in early 1988, and in order to catch up with that growth, they've added new management," Seidler said. "The company has capitalized in a big way on all the resources of Sun."

Although its acquisition by Sun in April 1987 has given TOPS a big boost, the company notched a number of firsts on its own.

Seidler and other analysts pointed out that until recently, for users that wished to link their Macintoshes and Personal Computers on the same network, TOPS was the only game in town. And in the IBM arena, TOPS has one of the least expensive, yet most powerful, networks available today, the analysts said.

"Even today, if you're a user buying only IBM who doesn't need a central data base capability but just wants to communicate between nodes and peripherals, TOPS is one of the best solutions," Seidler said. "Although the LAN industry at large may have overlooked it, TOPS' popularity has not been missed by rival vendors. One indication of this is Novell's addition last year of its Entry Level System version of NetWare and 3Com's recent announcement of [entry-level versions] of both its 3+ and 3+Open operating systems."

Nonetheless, Shapero vowed, "We don't intend to be the invisible LAN vendor anymore." Within the last several months, TOPS has staged a series of "road show seminars" to acquaint end users and resellers with the TOPS product line.

InBox rights acquired

Also, TOPS recently acquired the marketing and product development rights to Bedford, Mass.-based Symantec, Inc.'s InBox.

InBox is an electronic mail package for Macintosh and IBM Personal Computer local nets. The acquisition of InBox was an easy sell at Sun, Shapero related. "For the last 10 months, we've had at least 200 people within the company who've been using it, and [Sun President] Scott McNealy is very enthusiastic about it."

InBox enables Macintoshes and IBM Personal Computers attached to an AppleTalk network to exchange E-mail messages and files.

According to Shapero, InBox is one of the premier Macintosh-to-Personal Computer E-mail packages on the market today, the other being Microsoft's Corp.'s Microsoft Mail.

The seven Symantec employees that developed InBox will move into Sun's Billerica, Mass., facility within the next several months. There, in conjunction with TOPS personnel, they will add features to InBox to "make it a complete message center," Shapero said.

"We're going to add fax mail, voice mail, scheduling, routing lists and conferencing features," he said. "And I guarantee that we'll have one million of these E-mail packages installed within the next year."

TOPS will provide InBox users with upgrades at a nominal charge. Delivery is slated for mid-1989. TOPS will sell InBox for $350.

Market strategy

Shapero's strategy is to "distribute InBox to such a wide user base that we'll immediately create a standard for Macintosh messaging," he said. The TOPS Division has assumed distribution of the two current versions of InBox.

Shapero is betting demand for a comprehensive, easy-to-use, powerful E-mail package will fuel continued demand for the TOPS network.

"The largest benefit for TOPS is that right now we've established a beachhead with our users based on file sharing and printer sharing. That's why they buy us," he said. "Now that we've got InBox, I believe that other users will buy the network just for the messaging capabilities."

For the immediate future, Shapero said, "We've undertaken some MS-DOS development projects in order to ensure that the DOS side of our TOPS product is as robust as the Macintosh side of the product."

One such project involves TOPS support for Network Basic I/O System applications. TOPS, Shapero said, will announce this capability before the end of the year. ◻

CDC offers new version of NOS/VE

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Data Link Control link. CDCNET will also now support IBM 3270-type terminals without protocol conversion.

Current NOS/VE users covered under a maintenance agreement will receive NOS/VE Release 1.4.1 at no charge. The cost to add NFS support ranges from $3,000 to $6,000, and the cost of adding Archive/VE ranges from $6,900 to $75,000. The X.400-compatible version of Mail/VE costs $5,300. Current CDCNET users with a maintenance agreement will receive the enhancement free of charge. Pricing for the LCN enhancement has not been determined.

CDC can be contacted at HQW10H, P.O. Box 0, Minneapolis, Minn. 55440, or call (800) 553-2215, ext. 100. ◻

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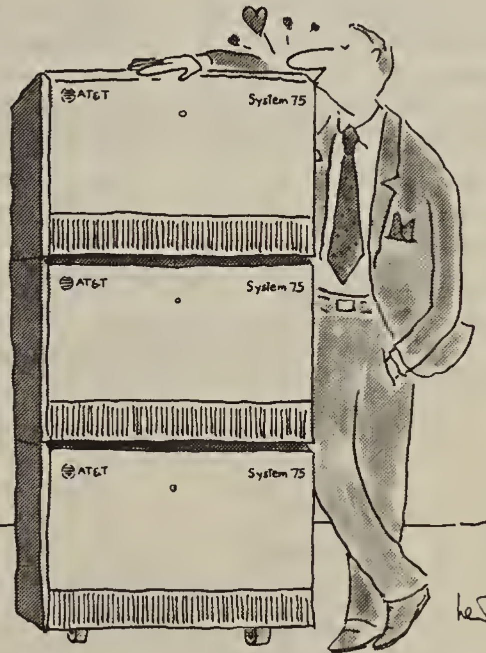

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Insurers team up for net project

continued from page 1

networking schemes of multiple insurance providers. That puts them at a disadvantage when it comes to their biggest competitors, brokers representing only one insurance provider.

At a meeting here last week, the subcommittee voted to work toward setting up a private company that will specify standards for documents moved over the network.

The task force also decided to negotiate for transmission services from Insurance Value Added Network Service Corp. (IVANS), a Greenwich, Conn.-based firm that provides networking services for insurance companies.

IVANS, which is supported by the IBM Information Network, provides communications services mostly for brokers and suppliers in the property and casualty fields. It does little work with life insurers, mostly because of a dearth of standards for moving life insurance documents over the net.

"Our hope is to have all the mechanics for an industrywide network in place by the spring of 1989," explained George Lang, president of Dallas-based International Brokerage Agencies, Inc. and chairman of the NAILBA task force.

"It will take years after that, however, before the network really starts working the way we envision," he said.

The problems independent life insurance brokers have faced working with incompatible networks are classic examples of the difficulties posed by proprietary communications systems.

"Brokers can have computer rooms filled with 10 to 20 systems [for each provider]," explained Robert Poage Sr., president of Robert Poage Insurance and Financial Planning Center, Inc., based in Sacramento, Calif. "It can get expensive to maintain all this equipment, which in turn makes communicating with each insurance provider a hassle."

As a result, many large brokers have limited computer and communications systems.

In an industry as rife with paperwork as insurance, this creates an information logjam. Insurance providers pay an average of $130 to process each policy, according to Bob Speicher, vice-president of marketing for Multidata Corp., a San Jose, Calif.-based vendor that sells computer systems and software to life insurance firms. These expenses are primarily the result of having documents entered multiple times by data-entry personnel. Speicher said this number could be cut nearly in half if brokers and insurance companies built systems that let them send documents back and forth electronically.

Many large brokers have limited systems.

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Brokers who work with only one company find it much easier to build networks. Usually, if these brokers work in the insurance provider's offices, they simply work directly on the provider's network.

"Agents who work for one provider can get better networks [than independent agents]," Speicher said.

Bill Simpson, who will become NAILBA chairman at the organization's annual meeting this November, reiterated the benefits independent brokers could gain from a common system. "The administration of life insurance has gotten very complex," he said. "Networking us all together would help immensely." ◘

Software links NetWare

continued from page 5

will continue to be major players in the future," he said. "We wanted to provide a way for users to work with both of them."

An Interlan spokesman said users could configure LAN Manager servers to provide interoperability between OS/2 LAN Manager and NetWare local nets, but it would take a good deal of skill.

The introduction of the LMN Server comes just one week after 3Com began shipping its 3+Open LAN Manager ("3Com first to ship OS/2 LAN Manager," *NW*, Oct. 17). Industry experts predicted the 3Com announcement would speed migration to OS/2 since the product supports microcomputers running either DOS or OS/2. Such dual support allows users to protect their investment in DOS machines while migrating to OS/2.

Interlan's announcement should have equal impact, the spokesman said. A huge installed base of NetWare users exists, but those users will not have to get rid of NetWare to migrate to OS/2.

"The battle was shaping up with 3Com, Microsoft's LAN Manager and the IBM LAN Server on one side of the fence and Novell NetWare on the other side," said Eric Arnum, a data communications analyst for New Canaan, Conn.-based International Resource Development, Inc. "This obviously isn't a truce between Microsoft and Novell, but it accomplishes the same thing."

The LMN Server is scheduled to be available for delivery during the first quarter of 1989. It carries a retail price of $895.

Interlan is located at 155 Swanson Road, Boxborough, Mass. 01719, or call (508) 263-9929. ◘

Calendar

Oct. 31-Nov. 1, Washington, D.C. — Systems Integration Conference. Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Oct. 31-Nov. 3, Chicago — AUTOFACT '88 Conference. Contact: Society of Manufacturing Engineers, 1 SME Drive, Dearborn, Mich. 48121.

Oct. 31-Nov. 4, Chicago — James Martin World Seminar. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Nov. 1-2, Los Angeles — Larry DeBoever's 1988 National Conference on Managing DEC-IBM Integration. Contact: The Center for Technology Concepts, Inc., 3 Independence Way, Princeton, N.J. 08540.

Nov. 2-4, Huntington, Long Island — T-1 & ISDN Primary Rate Design Seminar. Contact: CVD, Inc., 28 Roosevelt Ave., Hicksville, N.Y. 11801.

Nov. 2-4, Boston — LOCALNET '88. Contact: LOCALNET '88, CMC Registration Department, 200 Connecticut Ave., Norwalk, Conn. 06856.

Nov. 2-4, San Francisco — Telecommunications Management. Contact: *Business Communications Review*, 950 York Road, Hinsdale, Ill. 60521.

Nov. 6-9, Boston — TechConnect Boston: The Independent Wang Tradeshow. Contact: TechConnect Boston, Suite 385, 8310 Capital of Texas Highway, Austin, Texas 78731.

Nov. 7-9, New York — Voice/Data Integration and ISDN. Contact: Institute for Advanced Technology, 1450 Energy Park Drive, St. Paul, Minn. 55108.

Nov. 8-10, Los Angeles — Office Technologies Conference. Contact: Office Technologies Conference, P.O. Box 3727, Santa Monica, Calif. 90403.

Nov. 29-Dec. 1, Dallas — UNICOM 2 Expo and Conference: Building Bridges to the Integrated World. Contact: North American Telecommunications Association, 2000 M St., Washington, D.C. 20036.

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IBM E-mail software links with DEC, Wang

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tems Division, said Office Interconnect Facility is capable of passing revisable text among equipment from the three vendors. For example, a document originating on a DEC workstation could be passed to a Wang user, who can alter it and pass it to a third user working on an IBM machine.

Software residing on the IBM mainframe handles all necessary translations so documents are sent in a format that can be understood by the recipient's system, Abineri said.

"This is interesting from the standpoint that IBM is moving to recognize multivendor environments and is actually designing products that take into account Wang and DEC," said Lee Doyle, a senior analyst with the Framingham, Mass., consulting and market research firm International Data Corp. "I think that's extremely significant from a philosophical viewpoint."

Analysts were hesitant to compare the IBM product to similar products from other vendors since it has not been demonstrated publicly. All the components of the product will not be generally available until July of next year.

But Steve Wendler, program director at Gartner Group, Inc., a Stamford, Conn.-based consulting and market research company, said the distributed directory services of the IBM software are inferior to those offered by Wang or DEC. He said the IBM distributed directory service functions are static, whereas DEC's and Wang's are automatic.

For example, using features of DEC's All-In-1 or Wang's Office software to link multivendor E-mail systems, a new user has to be added only on the local node. From there, the change is automatically propagated throughout the network. With Office Interconnect Facility, a new user must be defined to each vendor's E-mail system, he said.

Analysts agreed there is a market for the product among users who are reluctant to buy an integration solution from a vendor other than IBM. "There's a huge market for it," Wendler said. "There's a certain percentage of the marketplace — true Blue customers — that want an IBM solution. It's really that simple."

General availability is scheduled for next March for the VM version and next July for the MVS version. Graduated monthly license charges range from $387 to $1,819 for the IBM system products and from $72 to $120 for the DEC and Wang system products. Graduated basic onetime charges for the IBM products range from $8,940 to $75,590 and from $1,380 to $2,300 for the non-IBM products.

In a separate announcement last week, IBM and Adobe Systems, Inc. unveiled an Adobe Postscript interpreter for IBM's Advanced Function Printing (AFP) users. The new software, residing on a mainframe, allows AFP printers to print Postscript documents.

Dubbed the Publishing Systems Postscript Interpreter for AFP, the software is a VM-based program that also allows the interchange of documents between workstation-based and host publishing systems.

Available now, the basic onetime charge for the software is $10,000, and the basic monthly charge is $385. ◘

AT&T reveals its integration plan

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fy any possible alliances.

AT&T recently purchased one company, Adelie Corp. of Cambridge, Mass., a software house that developed telemarketing software, called Close, for IBM mainframes. It will now work to provide links between IBM mainframes and AT&T computers and PBXs.

The division complements AT&T's more customer-specific systems integration efforts. AT&T's Data Systems Group, which sells AT&T computer systems, currently has an agreement with Electronic Data Systems Corp. (EDS), a third-party network provider, in which the Data Systems Group sells AT&T computers to support EDS services.

In addition, AT&T's Federal Systems Division is working with Computer Sciences Corp., which provides systems and communications services to the federal government, to bid for the government's giant Federal Telecommunications System 2000 project. The Federal Systems Division will remain focused on providing systems integration for the government sector.

AT&T has also developed custom voice and data nets under Tariff 12 for such users as American Express Co., Ford Motor Co. and General Electric Co.

AT&T has done some systems integration consulting at no charge when helping its customers link AT&T products together. AT&T will continue to do that, Yates said, but it will start charging customers when custom work or other vendors' equipment is involved.

AT&T's willingness to work with other vendors' equipment represents a change in corporate culture, Bernstein said.

However, the fact that the Systems Integration Division will recommend that a customer buy other vendors' equipment over similar AT&T products could cause some internal problems at the company.

For this reason, one of the challenges facing the division is getting support from AT&T's other divisions. Yates has the ability to draw personnel from other groups in order to complete a project. But the group losing the personnel could see its own product development timetables set back. This could create conflicts in which division managers would be upset when the Systems Integration Division takes employees away from their usual tasks, Bernstein said.

"If Chuck Yates can successfully pull this off, then he deserves to be chairman of the company," Bernstein said. ◘

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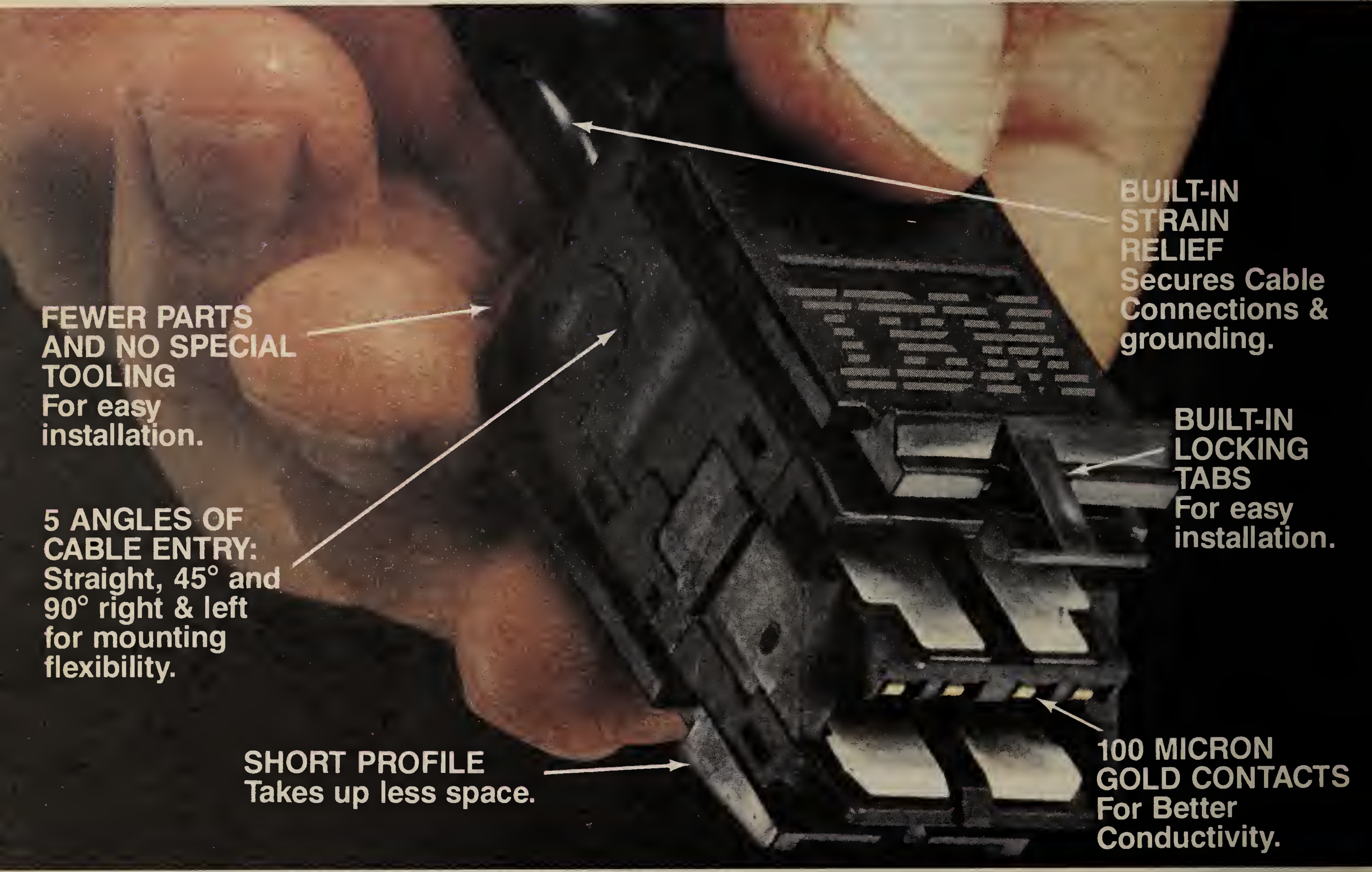
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